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Railway Age

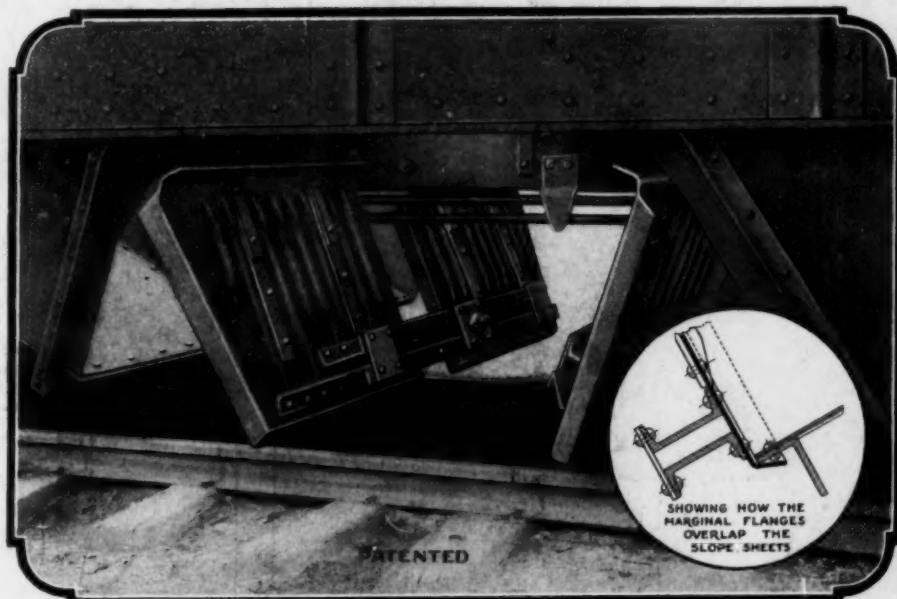
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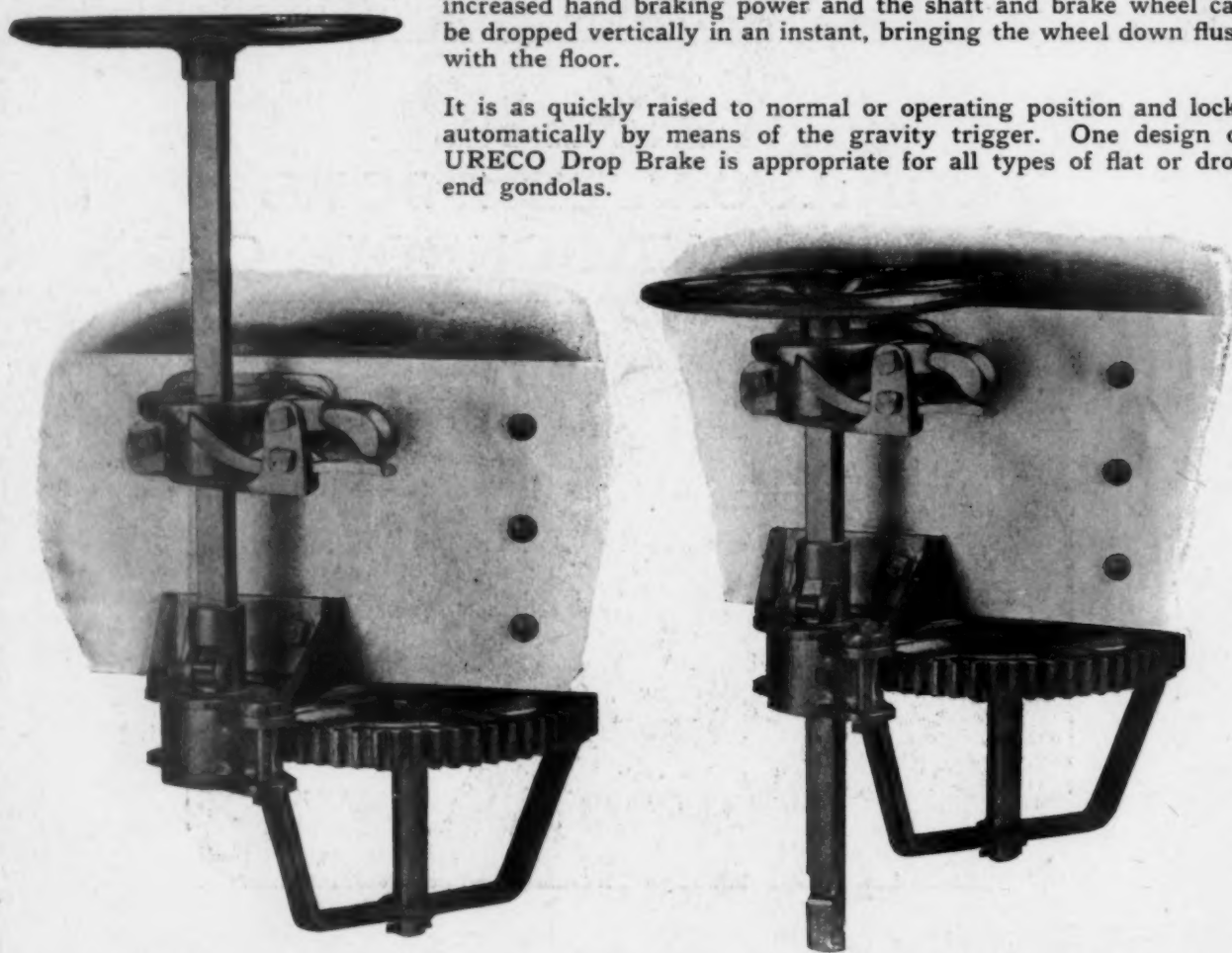
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EDITORIAL



Railway Age

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In the effort to reduce delays and eliminate unnecessary stops, their causes are being analyzed and studied by the

Cutting Down Delays

operating officers more carefully than ever before with a view to remedying faulty practices. One source of delay, when traffic reaches a certain density, is the use of the manual block. In

making a study of the cause of delays it would be well to determine definitely the loss of time caused by the manual block system for it will often be found that the replacement of the manual block with automatic signals for a few miles at some point on a division will relieve train movement troubles decidedly. It would appear that the operating officers on some roads have not given enough consideration to this method of producing economies and when methods for improving operation are being considered, greater use should be made of information which the signal engineer has in his file. By speeding up train movements, not only are economies effected for the road as a whole but better service is rendered the shippers which is important in competing for business with other lines. Elsewhere in this issue is an article describing the manner in which delays have been reduced at one place on a system by the installation of a short stretch of automatic signals.

It has been estimated that 20 per cent of all locomotive fuel is consumed at terminals. A part of the terminal fuel consumption is necessitated by locomotive

Non-Productive Locomotive Fuel

movements to and from the enginehouse and can only be reduced by a better arrangement of terminal facilities and closer supervision of the hostlers

who handle locomotives at the terminals. Another part of this loss results from locomotives standing under steam before they are placed in the enginehouse, or awaiting outbound train movement. This loss can be greatly reduced by improvements in terminal facilities that would soon pay for themselves by the fuel saved, to say nothing of the hours saved in the time required to turn locomotives. That part of the terminal fuel loss incident to washing, refilling and firing up locomotive boilers is also largely avoidable through the use of equipment that utilizes heat contained in the water and steam discharged from locomotives arriving at the terminal to heat the water used for washing and refilling locomotive boilers. Consider the amount of heat wasted when the contents of a locomotive boiler having a capacity of 5,000 gal. of water is allowed to flow into the sewer. This water probably has a temperature corresponding to 100 lb. steam pressure on the locomotive when it is placed in the house. If this steam is exhausted to the atmosphere it also represents a heat loss that must be replaced when the locomotive is steamed up again. To fire up the locomotive not only involves a replacement of the heat units wasted in the sewer and exhausted to the atmosphere, but requires a considerable consumption of fuel in a stationary boiler to supply steam required for creating draft in the stack blower. The heat in this steam is entirely lost since only the velocity of steam is utilized to create draft. Where the design and operation of stack blowers is not carefully scrutinized the

fuel loss from the operation of these blowers may run into enormous proportions. Even where the stack blower is properly proportioned, it may require the full capacity of a 40-hp. boiler to supply steam for a single blower. It frequently requires two and three times that quantity to supply the blower in firing up a locomotive. While a locomotive boiler is being fired up its fuel efficiency is seldom more than 25 per cent. If the water and steam discharged from the locomotive on arrival is wasted and the boiler washed with cold water, it will require over 4,000 lb. of 12,500 B.t.u. coal to raise 5,000 gal. of water from 60 deg. F. to steam temperature at 100 lb. pressure and to heat the metal in the boiler itself which may be assumed to weigh 60,000 lb. In addition to this, if the stationary power plant is operated at a boiler efficiency of 50 per cent, it will require more than 200 lb. of coal to supply the stack blower for an hour during which time the locomotive is being fired up. This is non-productive locomotive fuel from a transportation standpoint.

An unusually complete exhibit and demonstration of electric traction apparatus, described elsewhere in this issue, were

Electric Traction Exhibits and Tests

held by the General Electric Company at Erie, Pa., on Monday, May 19. The exhibit included electric freight and passenger locomotives, a 3,000-volt direct current multiple-unit train, a section

of laced overhead trolley and the otheograph—a device for determining the effect of locomotive operation on track. The tests included operation of the multiple unit train, speed and regeneration tests of the electric passenger locomotive, a tug-of-war, between steam and electric locomotives, and the testing of the trolley for its ability to collect current under various conditions of speed and trolley grade. For the tug-of-war and for the regeneration tests a Mikado steam locomotive was used. An experimental electric locomotive coupled to a car loaded with resistances was used for the current collection tests. These tests showed that 4,000 amperes could be collected from the trolley by one pantagraph collector at 60 miles an hour without objectionable sparking as the locomotive approached an overhead bridge necessitating a one degree grade on the trolley. The speed test of the electric passenger locomotive showed it to be in good condition after four years service on the Cascade division of the Chicago, Milwaukee & St. Paul; the locomotive seemed to ride as well as when it was new. The regeneration tests demonstrated the ability of the electric locomotive to hold a train on a down grade without the use of brakes and at the same time return power to the trolley. The tug-of-war was interesting to watch but proved nothing, since the steam and electric locomotives were of different designs and weights. The feature of the test and exhibit was the multiple unit train. The test consisted only of running the train up and down a four-mile section of track at a speed of about 40 miles an hour, operating it first from one end and then from the other. It is of importance, however, as there are many who have contended that 3,000 is too high a direct-current voltage for the operation of multiple unit equipment. This train has apparently been built for the purpose of demonstrating that such a train is feasible.

Education for Railway Service

AS TIME PASSES the number of college graduates who rise to important positions in railway service increases. The number ought to increase faster than it does. The railways might well give more encouragement to college and university courses in railway work and open wider the door of opportunity to college men in railway service.

But heretofore a large majority of railway officers have risen from the ranks of employees without having had college training, and this will continue to be the case for many years to come, if not always. Therefore, every reasonable effort should be made to stimulate employees of unusual natural ability to equip themselves to advance to higher official positions and to show them how they may do this.

One of the best articles on education for railway service ever published in the *Railway Age* was that by H. E. Thompson, a train dispatcher on the Chicago, Milwaukee & St. Paul, which appeared in our issue for March 22. As Mr. Thompson pointed out, an employee who is without college training can by industrious effort give himself all the education required to rise to the highest positions in railway service and to perform their duties with success and distinction. In fact, it is hardly an exaggeration to say that a youth who enters railway service with only a high school or even a grade school education, will have certain advantages in educating himself for railway service if he will profit by the opportunities that are open to him.

In the first place, railway employment itself is a fine school. A young employee can largely educate himself in the course of his daily work by performing the tasks assigned to him as well as he can and keeping his eyes open to see how the work of others, especially of his superiors, is done. In addition there is available to him an extensive literature dealing with all phases of railway history, construction, maintenance, operation, finance, statistics, valuation, regulation, etc. A large part of this literature has been published in book form, and there is an additional large literature published currently. Mr. Thompson referred in flattering terms to the editorial contents of the *Railway Age*, which do in fact, week by week, include articles dealing with almost every phase of the railroad business.

A young man, even though ambitious, is likely to raise a question as to when he can get the time to read and digest this literature. He must do it outside of his working hours. If he is ambitious and energetic, however, he will find little difficulty in getting enough time to do all the reading and study necessary. Official statistics show that in 1916 the average working day of railway employees was about ten and one-half hours and that it is now only about eight and one-half hours. A young man by utilizing regularly only the two hours by which the average working day on railways has been reduced in the last seven years, can within a few years read not only all the available literature upon railway subjects, but also numerous books on history, economics, the relations between government and business, etc., which will give him a vast fund of valuable information and a broader perspective than is possessed by most successful business and professional men.

This statement is not based on theory. It is based on the actual experience of many men who have been denied the opportunity of college training, but who nevertheless have achieved broad knowledge and the highest professional and business success. We could give the names of many railway presidents and vice-presidents whose success has been due to the fact that they not only learned all they could about the railroad business in their working hours but supplemented the knowledge thus acquired by reading and study outside of working hours. There is an advantage from an educational point of view in being engaged daily in doing practical work

and in studying the literature of that work at the same time, because there is then opportunity to apply in one's daily work the theoretical knowledge and broad information acquired at the same time by the reading and study done outside of working hours.

Of course, if a young man is to work eight hours a day and read and study two hours additional, he must sacrifice pleasures that he might have during those two hours. He will miss a good many moving pictures that his friends see and he may not learn to dance as well. But there is one thing every young man who desires to make a real success in railroading, or any other line of work must learn. This is that no real success is ever attained without many sacrifices of ephemeral pleasures being made while achieving it.

Young men who work and study hard for years often are disappointed in finding that advancement and success do not come as rapidly as they have expected. But success comes to but few men when they can still be called really young. Almost invariably however, it does come finally to those who work and study much harder than their associates, and when it does come it usually is in proportion to the intelligent efforts that have been made to achieve it. We say "intelligent efforts," because numerous men make the mistake of depending upon hard and faithful work at their daily tasks alone, whereas education is as necessary as work. Education may be secured in college or out of it, but the broad education which consists of wide information, of the power to think, of the ability to work not only hard, but efficiently, this kind of education, wherever and however secured, is necessary to success in the railroad business and in most other lines of professional and business activity.

A Labor Bill to Ruin the Railways

THE DETERMINATION of certain railway labor leaders and public men to ruin the railways financially, and the recklessness of the plans they publicly put forward for this purpose, are strikingly illustrated by a bill which has been introduced in Congress by Representative Huddleston of Alabama. Mr. Huddleston long has been recognized as the foremost spokesman of the railway labor leaders in the house. It was he who told members of Congress, as Congressman Tincher of Kansas said in a recent speech, that the Howell-Barkley bill had been drafted by the railway labor leaders and intimated that upon members of Congress who did not vote for this bill organized labor would take its revenge at the polls.

As the principal spokesman of the labor leaders in the house Representative Huddleston has introduced a bill which would cause a greater reduction of rates, and more quickly and certainly reduce all the railways to bankruptcy, than any other bill that has been introduced. It provides that the railways shall be forbidden in future to charge any rate higher than was in effect for the same service on August 25, 1920. This was just before the large advance in rates which the commission authorized in that month went into effect.

The introduction of Mr. Huddleston's bill makes it worth while to calculate just what the advances in rates granted by the commission in 1920 were, how much of these advances have been taken away, and what would be the financial effect upon the railways of such action as the more reckless anti-railroad propagandists favor.

When the advance in rates was granted in 1920 it was estimated it would produce an increase in earnings of about \$1,600,000,000. Subsequent developments have shown that this estimate was excessive. In the eight months of 1920 preceding the advance in rates the average revenue per ton per mile of the Class I railways was 9.65 mills and the average revenue per passenger per mile 2.620 cents. In the

year 1921, throughout which the advance in rates was in effect, the average revenue per ton per mile was 12.75 mills and the average revenue per passenger per mile 3.086 cents. On the basis of the actual revenue freight and passenger business handled in 1923 these advances in rates would have amounted in earnings to \$1,459,000,000.

But when the business of 1923 was actually handled the average rate per ton per mile had been reduced to 11.16 mills, or to 1.59 mills less than in 1921, and the average rate per passenger per mile had been reduced to 3.010 cents, or by about two-thirds of a mill less than in 1921. The number of revenue tons carried one mile in 1923 was 413,562,132,000. The number of passengers carried one mile was 38,005,922,000. Therefore, the effect of the reductions in freight and passenger rates between 1921 and 1923 was to make the freight earnings \$657,564,000 less and the passenger earnings \$25,464,000 less than they would have been if there had been no reduction in rates. The fact that there has been a reduction of passenger rates brought about by widespread readjustments, and that this has reduced passenger earnings by an amount equal to more than three-fourths of the so-called surcharge on Pullman tickets, has never before been pointed out so far as we know. The total reduction of freight and passenger rates since the advances were made in 1920, stated in terms of revenues, exceeds \$683,000,000 annually. This means that 47 per cent, or almost one-half, of the total advance in rates, both passenger and freight, granted in 1920 already has been taken away.

Let us now see what would be the effect of the adoption of Representative Huddleston's bill. Putting the rates back to where they were in the first eight months of 1920 would take \$776,000,000 more of their annual earnings away from the railroads. Their net operating income in 1923 was \$978,000,000. Therefore, unless operating expenses and taxes were reduced, the effect would be to reduce net operating income to \$202,000,000 annually. This would be one per cent on their present valuation and about \$500,000,000 less than the annual interest on their bonds and other fixed charges. Every railway in the country, large and small, would be bankrupted.

The fact that this bill was introduced by the spokesman of the railway labor leaders in the house is very good evidence that it has their endorsement and even indicates that it may have been drafted by them. It is a most significant fact that almost every bill which has the purpose and would have the effect of ruining the railroad industry emanates from some public man who is well known to work always in close accord with the railway labor leaders.

The advance in rates made in 1920 amounted to about \$3,997,000 a day in revenues. Reductions in rates made since then average about \$1,875,000 a day in revenues. In addition the taxes of the railways have been increased about \$200,000 a day, which makes the total reduction in the amount of revenues the railways are being allowed to collect from the public and keep to carry on their business about \$2,075,000 a day, or more than one-half of the total advance in rates granted in 1920. It may be asked why they have been able to stand this deduction from their revenues if they could not stand the further deduction contemplated by Representative Huddleston's bill. They have been able to do so because they have been able to effect a large reduction of operating expenses, including especially reductions of wages and of the number of men employed. If a bill such as Representative Huddleston's should be passed the very first thing the railways would have to do would be to lay off every employee with whom they could possibly dispense and the next thing they would have to do would be to put into effect a large reduction of wages. The result might, and probably would, be serious strikes, but there is at present no law, and no legislation is proposed, that would prevent the railway managers from making drastic reductions of wages, and such

legislation as is proposed would make them necessary immediately. If the present managers of the railways did not make them the receivers appointed by the federal courts to take charge of the bankrupted properties would do so.

Perhaps the strangest feature of the entire railway situation is that so many employees continue to follow leaders whose policies, if successful, would not only be ruinous to the railways, but disastrous to the employees themselves.

Direct Regulation by Congress

THE PASSAGE of the Gooding bill by the Senate illustrates a tendency that is being prominently manifested in the present Congress which, if allowed to prevail, would soon destroy the present system of government regulation of railways. This is a tendency to regulate by direct legislation instead of through the Interstate Commerce Commission.

The present system of regulation is predicated upon the principle that a law-making body may lay down general rules for regulation, but is incapable, owing to its very nature, of dealing with the special problems to which these general rules must be applied. Congress has to deal with innumerable different kinds of problems, and it is impossible for its members to have the special knowledge required to deal in detail with the railroad problem. It is recognized by existing laws that intelligent and fair regulation requires that the general rules adopted by Congress in legislation shall be applied in the solution of specific problems by a body of experts such as the Interstate Commerce Commission which is in continuous session and can acquire special knowledge and use it in solving all the various problems that arise.

The tendency being manifested by members of Congress to disregard the plain line of demarkation between the proper functions of Congress and the proper functions of the Commission with respect to regulation is illustrated by literally scores of bills that have been introduced at this session. The existing law forbids a railway to charge a higher rate for a shorter than for a longer haul, except under conditions which the commission holds make it just and reasonable to do so. The Gooding bill would arbitrarily forbid the charging of a higher rate for a shorter than for a longer haul, thus depriving the commission of all discretionary authority to make exceptions to the rule in proper cases.

The existing law directs the Commission to fix rates that shall be "just and reasonable." A just and reasonable schedule of rates must consist of rates which will not be unfairly discriminatory as compared with each other; which, in the aggregate, will be sufficient to enable the railways to pay reasonable wages, other operating expenses and taxes and a fair return upon the value of their properties, and which will not be unduly burdensome to travelers and shippers. No body of men could be capable of fixing just and reasonable rates on all kinds of traffic for all the railways of the United States unless it could devote the greater part of its time to the study of rate problems, and this Congress cannot do. Nevertheless numerous bills have been introduced in the present Congress to fix rates by direct legislation. Many bills have been introduced to abolish the surcharge on Pullman car tickets. Congress is wholly incompetent to decide whether the revenues that are now derived by the railways from this source should be derived from it or some other source. Various bills have been introduced to require the commission to reduce the rates upon agricultural products. Congress is wholly incompetent to pass upon the question of whether the present rates on farm products are reasonably remunerative to the railways or fair as compared with the rates charged on other commodities.

Perhaps the most striking example of the tendency of many members of Congress to try to get it to attempt to per-

form a function which can be performed only by an expert body having semi-judicial functions, is afforded by the various bills that have been introduced to repeal the present law regarding valuation of railways and require the commission to adopt new methods of valuation in carrying out which it would not be allowed to use any knowledge or exercise any judgment except that of the accountant or statistician. Under the Brookhart bill requiring valuation for rate-making to be based on the market price of securities, or the Dill bill requiring it to be based on the assessments of railway property made by the county assessors of the various states, the Commission would have no function except that of compiling statistics. It would hardly have any more opportunity to apply legal and economic principles in carrying out Senator La Follette's bill directing valuation to be based on the "investment prudently made and utilized." All these bills are intended to fix the valuation by practically direct legislation of Congress.

The bills of the kinds mentioned that have been introduced are sufficient to show what kind of regulation direct legislation by Congress would result in. Practically every bill has obviously been introduced to placate the people of some particular class or territory for political purposes. The Gooding bill has been introduced to curry favor with the people of the inter-mountain territory of the west. The Pullman surcharge bills have been introduced to placate the traveling salesman. The bills to reduce the rates on agricultural products have been introduced to placate the farmers. The Huddleston bill to reduce all rates to the basis on which they were on August 25, 1920, emanates from a congressman who represents union labor, and is intended to wreck the railways financially and promote the cause of government ownership. The same thing is true of the bills to change the law regarding valuation, all of which emanated from advocates of government ownership.

It would, as a matter of fact, be impossible to carry out a policy of direct regulation by congressional enactment which was not dictated by political considerations. Under such a policy practically all members of Congress would be subject to irresistible political pressure by their constituents to take from the railways the particular things that their own constituents wanted, and regulation of railways would be reduced to a disgraceful log rolling scramble in which the interests of the nation as a whole would be disregarded and sacrificed. Only a single national regulating body such as the Interstate Commerce Commission which is subject to pressure from all classes and territories, and which, because it is subject to pressure from all directions, is practically forced in self-defense to carry out a national policy, can regulate the railways with any intelligence and fairness.

It is a striking example of the effects of political pressure that numerous members of Congress who are in favor of preserving the Transportation Act, are nevertheless supporting and even have introduced bills to deal with specific questions such as that of the Pullman surcharge concerning which it is obvious that only a body such as the Interstate Commerce Commission, which has expert knowledge and considers the railway situation as a whole, is competent to decide. If Congress begins to pass bills reducing and fixing particular classes of rates, or arbitrarily limiting the exercise of the commission's judgment in adjusting rates and making valuations, the entire present policy and system of regulation will be speedily broken down. It is hard enough now to get men of sufficient ability to serve as members of the commission, and no man of ability would be willing to serve upon it if practically all its power to exercise judgment regarding questions presented to it was taken away.

In no other respect have members of this Congress shown more complete disregard for sound principles and the national welfare than they have by introducing literally hundreds of bills which are in effect a condemnation of what

the commission has done in the past in the regulation of rates and the adoption of which inevitably would reduce the commission to a mere automaton to register the political behests of Congress and which would drive every self-respecting and able men off the commission.

When Is a Locomotive "Held for Repairs"?

STATISTICS relating to railway operation are available from four principal sources: Bureau of Statistics of the Interstate Commerce Commission, the Bureau of Railway Economics, the Car Service Division and the annual reports of the railways to their stockholders. The Car Service Division statistics are the newest, except that car surplus and shortage figures were issued periodically for many years by the American Railway Association prior to the organization of the Car Service Division or its predecessor, the Car Service Commission, in 1917.

The Car Service Division was not intended to be a statistical organization. It was intended to assist in expediting the movement of cars and to supervise the location of cars to meet the needs of traffic. This work it has done remarkably well. We know of no one who hesitates to give to the Car Service Division a generous share of the credit for the railway accomplishments of 1923. In connection with its work the Division found it necessary to have made available to it a large amount of statistical data. This data is gathered from the railroads and tabulated. It forms the basis of much railroad publicity. The figures of car loadings and of car surpluses and shortages constitute two of the country's leading indexes of the volume of business. It is not generally known that the information presented in the Division's reports is filed with the Interstate Commerce Commission, which in effect means that the carriers file it with the Commission jointly through the Car Service Division.

The fact that the figures are so used is indicative of their value. On the other hand, it also gives the statisticians of the Division a certain burden of responsibility outside of that imposed by the statistical necessities of the Division itself. The usefulness of the figures lies chiefly in the promptness with which they are compiled and issued. There are no other figures relating to railway operation that are made available so soon after performance. Much of the information is available in no other way. Net ton-miles, which, like car loadings, are an index of traffic volume, are not shown by classes of commodities as are car loadings. There are no other figures that throw the same light on the current railway situation as is afforded by the car surplus and shortage figures. The report of per cent of home cars on home roads, or the reports of equipment delivered or on order, etc., give data not otherwise obtainable.

The statistics compiled by the Car Service Division are transportation statistics. Most of them were kept by the railroads in some form for purposes of current control prior to the time that compilation of them was begun by the Division. In effect, therefore, the Car Service Division statistics originally represented a gathering together in one place of information already available in the railroads' own reports. This, they continue to be. As a result a certain difficulty existed originally and still remains in a lack of uniformity due to varying methods of compilation by the different roads. The Car Service Division has recognized this condition and has attempted to remedy it. In spite of its efforts the Car Service Division reports have never had a scientific accuracy comparable with that of the O. S. reports filed with the Interstate Commerce Commission. There are two reasons for this lack of scientific accuracy. One is the short time

allowed for compilation. The other is lack of exact definition of the statistical units. The Car Service Division figures will never be entirely what opportunity permits them to be until this problem of exact definition is realized and solved.

The Car Service Division issues twice a month detailed figures relating to the condition of cars and locomotives, which figures, in total for all roads, are given wide circulation in the press. Figures of equipment condition are also included in the monthly operating statistics. The Car Service Division data, however, is available much sooner. Thus, we already have Car Service Division figures for April 15. The data on the operating statistics forms is not yet available for the month of March. The figures of equipment condition compiled by the Division are meant to be transportation statistics. They have in addition proved extremely useful as indexes of mechanical department activity. In fact, they have come to be used more for the latter than for their original purpose.

What is the situation with respect to these equipment figures? The answer is that it is far from satisfactory. Prior to January 15, 1924, locomotives held for repairs were reported under two heads; (a) those held for repairs requiring more than 24 hours, and (b) those held for repairs requiring less than 24 hours. The figure that was used most was the former. The latter has, in large measure, been disregarded. Effective with the January 15 report, the method of reporting the figures was changed. Since that time locomotives held for repairs have been shown, divided as between (a) those awaiting classified repairs, and (b) those awaiting running repairs; the first group has been further subdivided as among the respective five groups of classified repairs. Nobody knows how the new figures compare with the old. When the change was announced the form contained spaces for continuing the former basis of reporting on the more than or less than twenty-four hour basis. The figures, however, have not been made public, so that those who use the figures have lost their basis of comparability.

When the new basis of division between classified and running repairs was adopted there was at once difficulty of determining what was a "running repair." It was supposed that the new total of locomotives held for repairs, divided now between classified and running, would equal the former total divided as between heavy and light. Under date of February 26 attempt was made to define running repair more explicitly as a repair requiring over 24 man hours.

This new definition has apparently failed in its object. It suffers because a new basis is introduced differing from that ruling in connection with the equipment condition data reported to the Interstate Commerce Commission on the O. S. forms, which situation complicates the work of those who have to compile the figures. That the definition has introduced a new element in the situation is shown by the figures that the Erie and other railroads have recently been reporting. The Erie owns about 1,500 locomotives. Its report as of March 1 showed 207, or 13.5 per cent, of its locomotives held for running repairs; the March 15 report, however, showed 421 or 27.5 per cent, that for April 1, 393 or 25.8 per cent. The average per cent of locomotives held for running repairs as reported by all of the roads of the country on April 1 was 17.9. If the Erie report is to be accepted as comparable with that for the other roads it shows the worst condition of any large road in the entire list. It is impossible to believe that Erie power is in the unenviable condition reflected in these figures.

A similar situation appears with reference to the figures of locomotives turned out of shops. Again citing the Erie figures as an example, for the period ended March 1, 1924, the total of locomotives turned out of shop after having received running repairs was 376. For the following period ended March 15, it was 4,936; for the period ended April 1, it was 5,068. These figures indicate that in the month of

March a total of 10,004 locomotives received running repairs on the Erie, equivalent to $6\frac{1}{2}$ times for each locomotive owned. There are other roads that report their locomotives as receiving running repairs on the average of two or three times in a month whereas some report running repairs averaging once a month or even once in two months per locomotive. The figure for the entire country for March was 59,887 running repairs and the number of locomotives is approximately 64,600. Such wide discrepancies should be eliminated. As long as they exist it is entirely unsafe to use the figures in an attempt to reach any conclusion as to the railways' locomotive repair situation.

It was thought that when the figures of locomotive and car condition were first issued they would prove a useful index of equipment maintenance. There has been an increasing use of them for this purpose. The figures have great value. The existence of this value and the recognition of it by those who use the figures demand that they be accurate. If they cannot be made accurate and if proper definition of the terms cannot be worked out it were better that the compilation of them cease. That, however, would be retrogression. The remedy is to improve the methods of compilation.

In an article on another page of this issue, J. E. Slater, assistant to the general manager of the New York, New Haven & Hartford, covers the problem from this and other equally important angles. He discusses the entire situation as to mechanical department statistics. The point he makes is pertinent. It is that, from the standpoint of statistical control, the mechanical department trails other departments. In the Car Service Division data there is made a start in the right direction.

Know Your Costs

THE GROSS TRAIN LOAD on a large western road during 1923 averaged 1,185 tons, the speed of its freight trains 11.8 miles per hour and the gross ton-miles per train hour 13,955. Another large road operating in the same general area maintained an average gross train load of 1,604 tons, an average speed of 12 miles per hour and gross ton-miles per train hour of 19,236. This increase in gross ton-miles per train hour of more than 35 per cent was due primarily to the heavier train load of the second road, aided also to a small extent by the slightly higher speed at which the heavier train was operated. If the first road could have handled its traffic at the unit per gross ton-mile which prevailed on the latter road, its cost of freight train service would have been reduced more than \$5,800,000.

A similar comparison of two other large and fairly comparable roads showed somewhat different results. The gross train load on one of these roads averaged 1,738, and the miles per hour 10.6, while the gross tons per train on the other road averaged 1,637 and the miles per hour 12.1. As a result the gross ton-miles per train hour of the first road were 18,402 and of the second road 19,844, or 8 per cent greater. In this case, the heavier train load of the first road was more than offset by the higher speed of the second one. If the first road had operated at the unit cost per gross ton-mile of the second road, its cost of freight train service would have been reduced more than \$4,000,000.

These figures demonstrate what is generally known but not sufficiently appreciated that transportation costs are affected by both train load and speed and that in the endeavor to build up the train load there comes a time when the cost of producing a ton-mile not only ceases to decline but actually increases. This point is not fixed for any railway as a whole. It varies with the local conditions on each engine district. It also fluctuates with the variations in density and character of traffic on each district. Since the net income

of a railway varies both with the amount of traffic handled and with the cost of handling it and since the first is within the control of a railway to only a limited extent, the greatest opportunity which operating officers have to increase the net income is through the reduction in the cost of moving this traffic. This can be done only through a knowledge of this cost at the time it is being handled. Comparisons such as those which have been quoted above are valuable in demonstrating the possibility for the compilation of similar information by and for the local officers on each division so that they in turn can so move their traffic from day to day as to incur the minimum expense. Information such as this does not contemplate the development of new principles of transportation, but merely the more direct application of principles which are already recognized and in effect in a general way on most railways.

Books and Special Articles of Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Inland Waterways Corporation. Senate Report No. 538, 68th Cong., 1st session, recommending passage of S 3161 to create corporation under sections 201 and 500 of Transportation Act. 6 p. Published by Govt. Print. Off., Washington.

The Inter-Ally Debts; an Analysis of War and Post-War Public Finance, 1914-1923, by Harvey E. Fisk. 365 p. Published by Bankers Trust Co., New York.

Labor Disputes and the President of the United States, by Edward Berman. A thesis (Ph.D.) at Columbia Univ. discussing powers and duties of the President in various strikes, including railroad strikes. No. 249 of Studies in History, Economics and Public Law, edited by Faculty of Political Science, Columbia Univ. 284 p. Published by Columbia University, New York City.

The Office of the Chief of Engineers of the Army. Its Non-Military History, Activities and Organization, by W. Stull Holt. Mentions Pacific Railroad surveys, but does not in account of early work, mention services as those mentioned in the First and Second Annual Reports of the Baltimore & Ohio Railroad, for instance. Institute for Government Research. Service Monographs of the U. S. Govt. No. 27. 166 p. Published by Johns Hopkins Press, Baltimore, Md. \$1.00.

Rebellion in Labor Unions, by Sylvia Kopald. The out-law railroad strike is one of the four insurgent strikes, the methods and significance of which are discussed by Dr. Kopald. 293 p. Published by Boni & Liveright, New York. \$2.00.

Report on Condition of Railroad Equipment. Submitted to Congress by the Interstate Commerce Commission, May 17, 1924, in compliance with S. Res. 438. 8 mimeo. p. Issued by Interstate Commerce Commission, Washington.

Periodical Articles

A Comparison of the Labor Provisions of the Transportation Act with Those in the Barkley-Howell Bill, by Walter H. Newton. Congressional Record, May 17, 1924, p. 9072-9073.

The Financial and Economic Situation of Roumania at the Beginning of 1924. Railroads, 1919-1923, p. 775. Statist, May 10, 1924, p. 771-778.

Motor Vehicle Registration 15,092,177, by Andrew P. Anderson. Figures for motor vehicle registrations, receipts from license fees, etc., by states, 1913-1923. Figures for

passenger cars, trucks, busses, etc., 1923, and gasoline tax receipts, 1923. Public Roads, April, 1924, p. 14-17.

How Radio is Remaking Our World, by Bruce Bliven. "Radio broadcasting should be declared a public utility under strict regulation by Federal authorities," p. 149. Century Magazine, June, 1924, p. 147-154.

New Books

United States Safety Appliances. A practical manual by H. S. Brautigam, formerly assistant to the master car builder, Chicago, Milwaukee & St. Paul. 232 pages, 3¾ in. by 6 in., illustrated, bound in manila. Published by the Simmons-Boardman Publishing Company, New York. Price \$1.00.

This book is a practical manual of the safety appliance laws, legal decisions rendered in cases arising under them, and Interstate Commerce Commission orders and interpretations covering the application of safety appliances to the motive power and rolling stock of steam railways in the United States. In its preparation, the author has drawn on a wide experience in dealing with the many questions arising in carrying out the provisions of the safety appliance regulations. In order to facilitate reference to the material, it has been divided into ten parts. Part I contains the text of the original Safety Appliance Act, the amendments and supplements thereto and the Ash Pan Act. Part II contains the orders of the Interstate Commerce Commission and the circular of the Master Car Builders' Association relative to the stencilling of cars. Parts III to VI contain the text of the government specifications for the several classes of equipment covered by the enforcing order of the commission, each part devoted to one class. A particularly valuable feature of these sections will be found in the explanatory comments that have been interspersed at numerous points in the text which suggest preferred practices where the text is open to more than a single interpretation. In Parts VII and VIII will be found rules for safety appliances on electric locomotives and on gas, electric and gasoline motor cars, respectively. These classes of equipment are not specifically covered in the order of the commission and, hence, these sections are not official requirements. They are, however, specifications which have been used and found in actual practice to meet the requirements of the law as interpreted by the inspectors of the Bureau of Safety. A very convenient feature of the book is contained in Part IX. This is the official classification of defects to be reported by government inspectors, accompanied by box car and caboose drawings, on which are shown the defect numbers in their proper locations. Reference to the drawings shows at a glance the numbers of all reportable defects and, by referring to the list, the nature of these defects may readily be determined. In Part X have been grouped general rules and definitions applying to all classes of equipment. Some of these rules are included in the various orders of the commission. Others are rulings which have been made in specific cases where doubt or dispute has arisen as to the intent of the law or the interpretation of the commission's orders. Special memoranda of a similar nature applying to specific classes of equipment are also included at the end of the section dealing with the rules for that particular class of equipment.

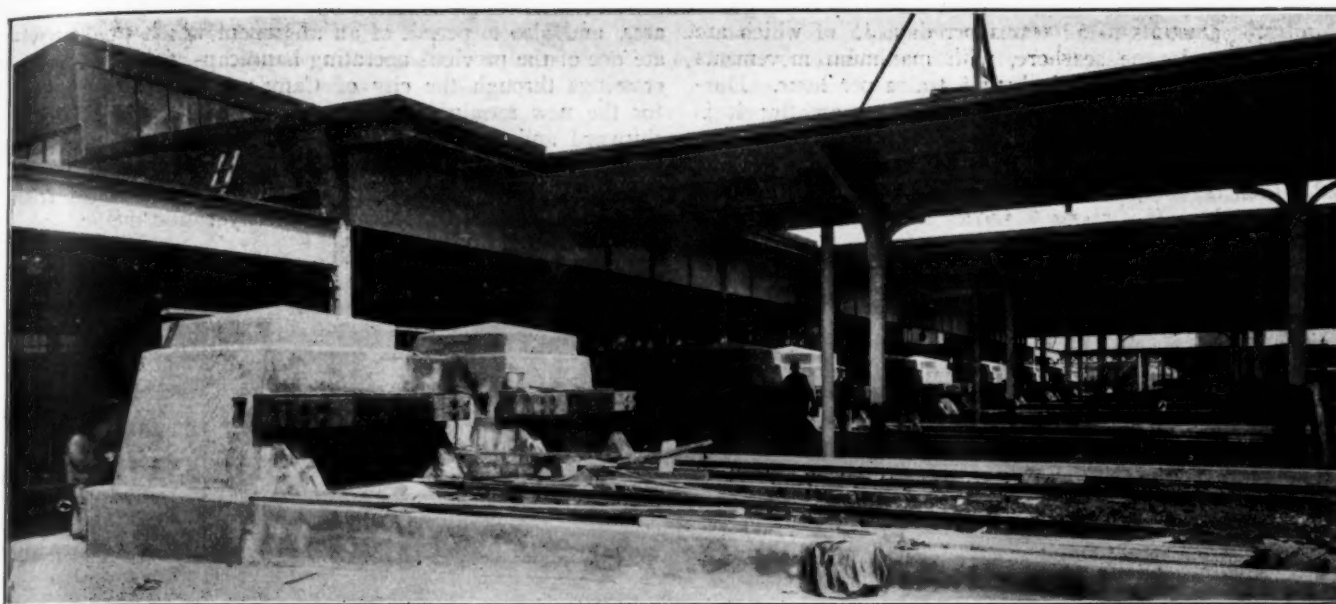
The illustrations include the official drawings of the Bureau of Safety specifications, and also numerous sketches illustrating alternative types of construction or applications which have been found to meet the requirements in a number of the cases in which questions have most frequently arisen. The book is of convenient pocket size and will prove to be a most useful volume to all who have to deal directly with the inspection or checking of safety appliances on steam railroad equipment.

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Heavy Concrete Bumpers Were Installed to Prevent Any Possibility of Overrunning

New Ferry Terminal Includes Advanced Designs

Reading Completes Interesting Installation at Camden,
N. J., to Handle Heavy Seashore Traffic

By Fred Jasperson

Assistant Chief Engineer, Reading Company, Philadelphia, Pa.

THE READING COMPANY has recently completed a combined ferry and railway terminal at Camden, N. J., to handle its heavy seashore and suburban traffic which has long overtaxed its present facilities. The new facilities are situated in a new location and have been designed to secure a rapid movement of passengers, trains and ferries under maximum summer conditions when 20 trains an hour leave Camden. The terminal is provided with four ferry slips placed at approximately a 45-deg. angle with the bulkhead line of the river, a large concourse

with covered ramp leading to 10 tracks protected with butterfly sheds. Four additional tracks are provided for maximum movement, but without cover sheds. A full complement of waiting rooms is provided on the first floor, with offices for the Reading Seashore Lines on the second floor. The terminal is of fireproof construction of steel and concrete resting on piling and sand fill.

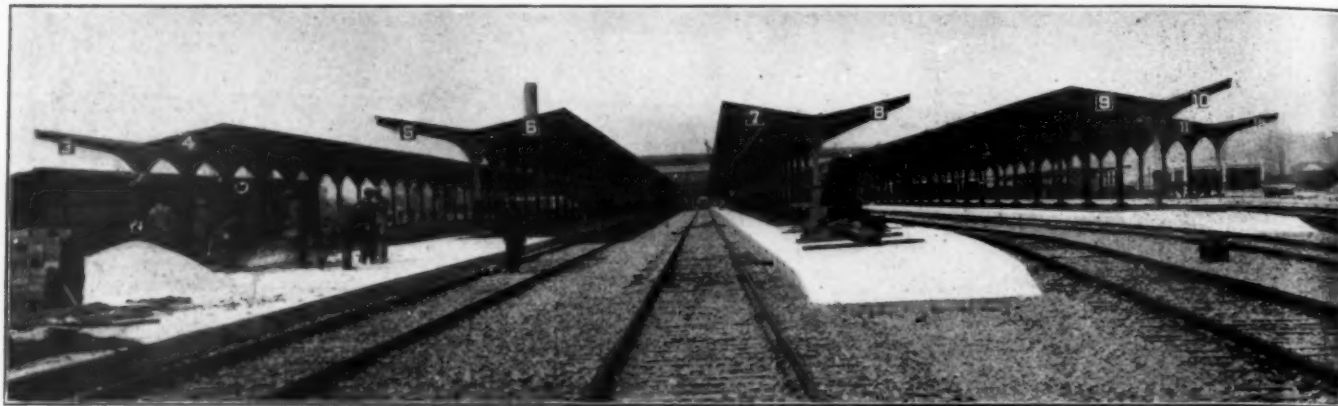
The Camden terminal of the Reading serves that company's high speed line to Atlantic City and other Atlantic shore resorts, as well as a suburban section of Philadelphia.



The Entire Terminal Is Well Designed and Attractively Arranged

This traffic amounts to 52 trains per day, 35 of which are express trains to the seashore, with maximum movements during commuters' hours of about 5 trains per hour. During the summer season, the traffic increases greatly; it is largely concentrated in a relatively few hours of the day, and results in a maximum traffic of about 77 trains per day with peaks of about 20 trains per hour. In handling this summer peak traffic, about 9 ferries are used between the

area, and also to permit of an alignment which would obviate one of the previous operating handicaps, namely, 7 grade crossings through the city of Camden. The area selected for the new terminal formed the site of the old Dialogue shipyard and comprised about 45 acres. It was necessary to make a fill of about 450,000 cu. yds. in order to utilize this area. This was chiefly sand and gravel dredged from the river and pumped ashore by the hydraulic method, plus



The Station Tracks, Platforms and Butterfly Sheds

Reading's Philadelphia ferry terminal at the foot of Chestnut street and South street. These operate on about a 10-min. headway, requiring a rapid discharge of passengers at Camden. In addition there is an extremely heavy vehicular traffic between Camden and Philadelphia which has to be co-ordinated with the passenger travel.

Replaces Old Terminal at Kaighn's Point

Previously the Reading maintained a terminal at Kaighn's Point, where there were three slips and seven

some cinder fill placed from cars. All foundations are of concrete and are supported upon timber piling. The outer sections of the headhouse are likewise pile supported, the piles being capped and decked at an elevation of mean low water. This construction supports a sand and gravel fill held in place with concrete retaining walls about 6 feet in depth. The remainder of the construction, such as the tracks, platform, ramps, etc., are carried directly on the fill.

An interesting feature of the layout is the arrangement of the slips on an angle with the general shore line of the



An Aeroplane View Which Shows Clearly the Platform and Track Arrangement

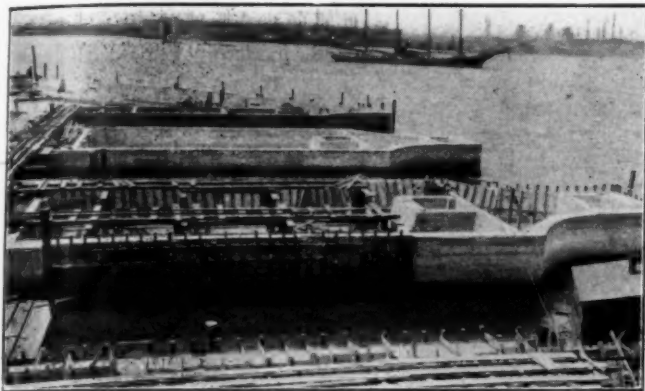
tracks. This terminal burned in 1915, and was temporarily reconstructed to handle the traffic. Plans were made following this, and construction started on a modern terminal in 1916. Work was held up, however, during the war, and it was not until government control ended that the project was resumed. A new location about a quarter of a mile below the old terminal was selected to secure a larger

river, the angle with the bulkhead line being about 46 degrees 38½ minutes. This arrangement was adopted to eliminate the delays to the ferries in entering and leaving the slips, since by using this angle all boats can head directly in or out from and to the slips on the opposite shore with but little change in their course. A careful check has been made to see if the angle of the slips would produce any eddying

currents that might result in a backing up of more than the usual amount of ice and floating debris that ordinarily collects in a ferry slip; it was found that this occurred.

Ferry Slips Placed at an Angle with the River

The slips are on 82-ft. centers and are approximately 160 ft. long. They are served with electrically operated bridges

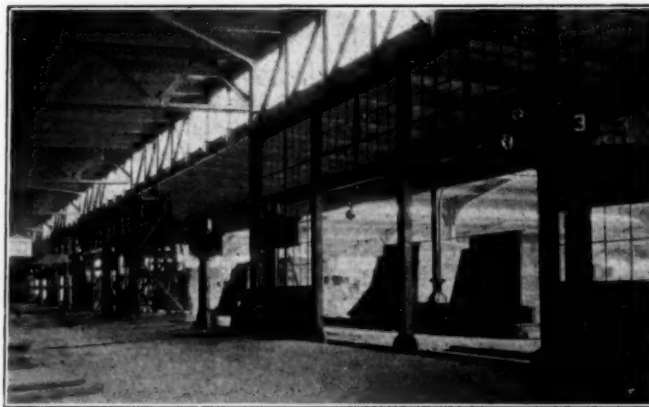


The Concrete Construction Around the Headhouses Between the Ferry Slips

discharging into a large concourse 330 ft. long and 90 ft. wide. The concourse opens directly upon an enclosed ramp section of the headhouse which is 246 ft. long and 115 ft. wide, the gates to the tracks being located along the long edge of this section, or approximately 205 ft. from the transfer bridges. The tracks are located at an elevation considerably above mean water in order to secure the elimination of one grade crossing near the throat of the yard. This in-

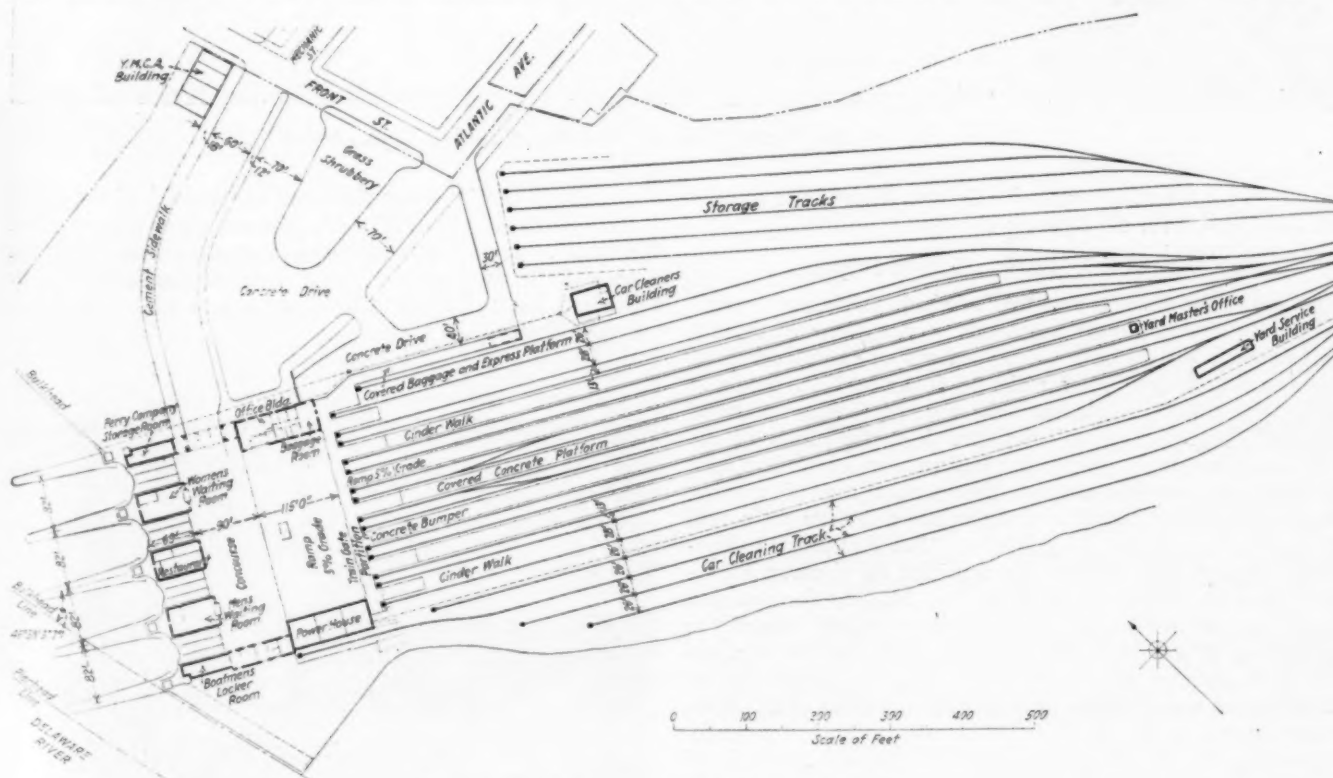
Interior Arrangement

The headhouse is of brick and steel construction. The concourse area is entirely free from columns, the roof being supported by heavy arched steel girders carried on steel columns and spanning the full width with a clearance of about 80 feet. The roof of the ramp section consists of steel trusses carried on three lines of steel columns on wide spacing, resulting in a floor area practically free from obstructions. Natural light and ventilation is secured by rows



A View from Inside the Partitions and Gates

of continuous steel sash located at the junction of the ramp section and the concourse, over the gates at the outer edge of the ramp, and by a monitor section along the center line. The roof structure is extended over the platform running across the stub ends of the tracks. The floors throughout the concourse and the ramp sections are of concrete. The wait-



General Plan of the New Camden Terminal

creased elevation resulted in the use of a track grade of about 0.3 per cent descending toward the headhouse, the remaining difference in elevation between the float bridges and the platforms being taken up by the ramp section with a 5 per cent grade and by a grade of 2 per cent across the concourse.

ing rooms and other passenger facilities are located in headhouses, situated independently between the ferry bridges, and consist of a ladies' waiting room, men's smoking and waiting room, a restaurant and a barber shop.

The main entrance is on the land side of the building and

is from Mechanic street and Atlantic avenue. The approaches to this entrance have been laid out to provide for ample accommodations for motorists. This has been secured by the use of a large parking area paved with concrete and by concrete driveways wide enough for four lines of vehicles. Separate driveways have been provided for baggage and express. The street entrance part of the terminal is a two-story brick and concrete office building, 115 ft. long by 42 wide. On the first floor of this building is the lobby, the ticket offices, check rooms, and the facilities for handling the express. The second floor is occupied by the railroad and ferry companies' offices. At the end of the concourse and ramp section of the terminal, opposite from that occupied by the offices, is a brick powerhouse which supplies the power for lighting, heating, operation of signals, steam and air for the cars, etc. The current is purchased at 26,400 volts

seashore points direct to the Camden terminal without the necessity of passing through Philadelphia.

Improvements Also Made on Philadelphia Side

In conjunction with the improvements at Camden, the Reading has made a number of improvements on the Philadelphia side. The railroad recently acquired the property of the Gloucester Ferry Company, and is providing an additional ferry slip, an elevated bridge over Delaware avenue with an escalator and stairway connecting the South street ferry station with the Philadelphia Rapid Transit Company's elevated station. The buildings at this station are also being re-arranged to accommodate additional traffic. Two new steel, 200-ft. ferry boats have also been added recently.

The design and construction of the Camden terminal has



The Concourse and the Ramp Section to the Gates During Construction

and stepped down to 440 volts for the operation of the bridges and to 110 volts for the lighting circuits.

An Attractive Station Track Layout

In the track layout are five covered platforms serving ten tracks and two open platforms serving four additional tracks which are utilized during periods of peak operation. The track spacing is alternately 28 ft. and 13 ft. center to center with 18-ft. platforms. The covered platforms are of concrete, protected by well-designed butterfly sheds of attractive appearance. The open platforms are of cinders held in place by concrete curbs. The tracks are of varying length, the center tracks holding about a 14-car train and the outer ones about a 13-car train. The facilities for handling baggage and express are provided on a covered concrete platform at the end of track No. 14. As these station tracks are on a 0.3 per cent grade descending toward the headhouse, it was necessary to make provision for an absolute prevention of any over-running of cars. This was secured by the use of large-sized concrete bumping posts measuring approximately 8 ft. 6 in. by 10 ft. 9 in. by 12 ft. Adjoining the station track layout are two storage yards of six and four tracks respectively with a total capacity of 116 cars.

Among the other facilities of the terminal are a Y. M. C. A. building, a new signal tower and battery house, a filtration plant with a capacity of 1,500,000 gal. daily and an arrangement for docking passenger boats of the Wilson Steamboat Line operating between Philadelphia and Wilmington, Del., thus bringing patrons from Wilmington to the

been carried out by the engineering department of the Reading, under the direction of S. T. Wagner, chief engineer, and the writer. J. L. Cozzens, assistant engineer, was in direct charge of the field work. The steel work was fabricated by the New York Shipbuilding Corporation and erected by company forces.



Ewing Galloway

Grand Central Station, New York, as It Was in 1889

Special Session of A. R. A. Held at Chicago

American Railway Association and Association of Railway Executives Consider Reports

A JOINT MEETING of the American Railway Association and the Association of Railway Executives was held at the Blackstone hotel, Chicago, on May 15, at which 124 representatives were present, representing 259 members. The meeting first considered the report of the Car Service Division which reviewed transportation conditions during 1923 and the first four months of 1924 with an analysis as of May 1, 1924, of present and prospective business conditions as related to transportation service. The report was approved and the Car Service Division was directed to keep the public fully informed regarding transportation performances, facilities and requirements.

The second report considered was that of the Transportation Division, relative to changes in car service rules 1 to 5 inclusive which were abstracted in the *Railway Age* of May 3, page 1103. This report, which has been considered at the meeting of the Transportation Division at Atlantic City, was approved by the American Railway Association and the Association of Railway Executives. The recommendations of the Operating Division relative to the standard form of application blank, showing information as to former employment; specifications for torpedoes; interpretations of the standard detour agreement and train orders; standard form for detour agreement; standard code of train rules; and block signal and interlocking rules were adopted as recommended standards of the association. The report of the Mechanical Division on the standard box car was discussed and the association approved the action of the board of directors in referring this report back to the Mechanical Division for further review. A report from the Mechanical Division on interchange rule 112, relating to the settlement for rebuilt cars destroyed in interchange was also discussed and referred back to the division for further consideration.

Report of Car Service Division

The following statement concerning the work of the Car Service Division was authorized and the appended resolution was unanimously adopted.

At a meeting of the associations in New York, April 5, 1923, a program was adopted to provide adequate transportation service during 1923. In a statement accompanying this program it was pointed out that, despite the cumulative effects of the coal miners' strike, beginning April 1, 1922, and of the shopmen's strike, beginning July 1, 1922, the railroads in the 37 weeks between July 1, 1922, and March 17, 1923, handled the greatest volume of traffic ever transported in the history of the country during any corresponding period. In accordance with the program, arrangements were perfected for the necessary cooperation between the railroads themselves and with the shipping public for greater efficiency in operation, and for expenditures required for adequate additions to existing facilities, in order to accommodate the anticipated increase of traffic.

At a subsequent meeting, held in New York, on November 8, 1923, the progress made under the April, 1923, program was carefully reviewed and it was found that, in the larger movement of traffic, in capital expenditures for additional equipment and other transportation facilities, in actual additions to the equipment and other facilities of transportation, in repairs of equipment, in the storage of coal, in lake coal movement, in heavier loading of cars, in greater mileage per car per day, in speedier loading and unloading of cars, and in important cooperation between the railroads and with and by the shipping public, the foregoing program had been successfully carried out and transportation, not only adequate, but most satisfactory to the public, had been furnished. A cooperative program was thereupon adopted to provide adequate transportation service in the remaining months of 1923 and in 1924.

It is now possible to review the performance under this program for the entire year 1923 and for the first quarter of 1924. During this year and a quarter the railroads have handled successfully

and efficiently a volume of traffic greatly in excess of that ever previously handled during a similar period, and have done so with practically no car shortage and with no congestion.

The gratifying results of this effort may be thus summarized:

1. The greatest freight traffic ever handled in any similar period of time, together with an unusually even distribution of tonnage throughout the year.

2. Full and complete coordination between the managements of the various railroads and with the Car Service division.

3. A larger number of new cars and locomotives installed than for many years during a similar period.

4. A marked reduction in the percentage of unserviceable locomotives and cars awaiting repairs.

5. The greatest coal movement to the lakes and a larger volume of coal for railroad use in storage than ever before.

6. A substantial improvement in the average miles per car per day and in the average tons per loaded car.

7. An unfavorable car distribution at the beginning of the period corrected, and an equitable location of cars maintained between various sections of the country.

8. A decrease, both in freight accumulations and car shortages to negligible figures, and an increase in car surplus; all during the period of unprecedented car loading.

9. Public cooperation and confidence expressed by wide participation in shippers' regional advisory boards which have been established throughout the country for the purpose of arriving at a solution of transportation problems through conference between the shippers and the railroad managements.

10. Further improvement of the organization and functions of the Car Service division through the establishment of district offices to provide an adequate supervision of service requirements and car distribution.

The accomplishment of these results involved the adoption and carrying through of a courageous program of capital expenditures and commitments in order to provide additional equipment and to enlarge and improve transportation facilities. This program resulted in the actual expenditure of \$1,059,149,426 during the year 1923 for new equipment and other improvements.

The gratifying and encouraging results which have been stated could not have been accomplished without adequate input of new capital or without

A Effective coordination and effective cooperation between the managements of the several carriers.

B The loyal support of officers and employees in every branch of the service.

C Sympathetic and effective cooperation on the part of the shipping public.

In view of the record of efficiency shown by the actual results of operation above referred to, of the preparation successfully made to meet new and pressing demands of the public for additional transportation, of the large reduction to the public of transportation costs already realized, and of the satisfactory service which has been and is still being rendered, it would be manifestly unwise to destroy the capacity of the railroads to develop further policies for improvements and expansion to meet the growing needs of commerce. Yet this will be the inevitable result if the statutory policy of reasonable and necessary protection and fair treatment for railroad investments is abandoned and a policy of hostility and oppression is adopted in its place.

It must be realized that the carriers cannot continue the effective work they have been doing or make the necessary preparation to meet the requirements of commerce, if the assurance of a fair and constructive policy on the part of Congress is withdrawn.

The railroads invoke the continued confidence of the American people and reaffirm their faith that the public and the agencies of the government, state and national, which have the final voice in controlling railroad revenues and expenses and in determining the quantity and quality of transportation service, will continue to recognize that the future growth and prosperity of the nation is dependent upon the continuation of a definite and sustained program for adequate transportation service.

The continuation of such a program plainly will be possible only if the carriers are allowed to earn a net income sufficient to permit a reasonable and just return upon property now devoted to the public service and to create the credit essential to obtain the new capital required to keep pace with the agricultural, commercial and industrial growth of the country.

If a helpful and constructive policy is continued, the carriers

announce with confidence that they will be able to meet successfully the requirements of the public for transportation, and specifically commit themselves to the accomplishment of the following purposes:

(A) Continued enlargement of transportation plant by purchase of additional equipment, and improvement and extension of existing roadway facilities, calculated to produce further economy in operation and increased capacity. This purpose is already evidenced by the fact that there are now on order 520 additional locomotives, 69,298 freight cars and 970 passenger cars.

Capital expenditures for equipment and facilities to improve service, made in 1923 and authorized for 1924, are as follows:

Actual expenditures in 1923.....	\$1,059,149,426
Work authorized and carried over from Dec. 31, 1923.....	\$420,000,000
Additional authorizations made in first quarter of 1924.....	346,000,000
Total expenditures under way or authorized during 1924 to April 1.....	766,000,000
Actually expended on the above to April 1.....	185,500,000

These sums have been and are being expended and appropriations authorized, most largely from borrowed money, in confident reliance on the stability of the policy of Congress, as stated in the Transportation Act, to give fair protection to capital invested in property devoted to the public service in transportation.

These expenditures were necessary not only to furnish adequate service, but to promote economies and to lessen operating costs. It is worthy of note that the reduction in rates have been so substantial that if the traffic of 1922 had been carried at the rates of 1921 the public would have paid \$336,303,000 more than was actually paid, for service in 1922, and if the traffic of 1923 had been carried at the rates of 1921 the public would have paid \$657,563,000 more than it actually did for the service in 1923. The result in the two years of 1922 and 1923, therefore, has been a lessened cost to the public for transportation service amounting to approximately one billion dollars due to reductions in rates.

(B) The maintenance of locomotives, cars and other facilities in serviceable condition to the highest practicable degree consistent with traffic demands and anticipated requirements. As of May 1, 1924, there were on American railroads awaiting transportation demands a surplus of 329,489 cars and 5,508 locomotives, all in good order.

(C) The replacement of unserviceable and light capacity cars and locomotives with new and heavy capacity equipment.

(D) Definite encouragement of cooperative efforts on the part of the carriers and the public to spread traffic movements over all periods of the year, thereby reducing costly transportation surpluses and insuring more economical and efficient transportation service during the entire year.

At the present time a reluctance is apparent on the part of receivers of freight to order shipments of material and supplies in advance of actual immediate needs. Should this situation continue it may result in abnormal peak transportation demands during the heavy movement of agricultural products in the fall months, thereby increasing not only the difficulty but the cost of transportation and likewise increasing the detention of equipment at destination.

(E) Consistent and determined cooperative action on the part of the railroads and the public to obtain greater utility out of every transportation unit, particularly in connection with:

1. More prompt movement, thereby increasing average miles per car per day.
2. Heaviest practicable loading per car.
3. Loading and release of cars where practicable within 24 hours.
4. Placement of reconsigning orders on cars to greatest extent possible before arrival at reconsigning points.
5. Prompt release of cars shipped on order bills-of-lading.

(F) Adherence to the agreed car service rules and specific instructions of the Car Service division in order to maintain current equitable relocation of cars.

(G) Development in the highest possible degree of the foregoing and other forms of cooperation with shippers and public regulating bodies through the regional advisory boards, realizing the contribution such organized effort has made and will continue to make to the cause of efficient, economical and adequate railroad transportation.

It was resolved that the foregoing statement be unanimously adopted by the member roads of the American Railway Association and Association of Railway Executives as a definite expression of their policy, individually and collectively, for the current year.

Report of Mechanical Division

The Mechanical Division submitted reports on two subjects, (a) Standard Box Cars, and (b) Interchange Rule 112—Settlements for Rebuilt Cars When Destroyed in Interchange.

The division reported that it had completed a letter ballot

of the members on the proposal to adopt designs for standard box cars and trucks. The designs submitted to letter ballot consist of (1), a single sheathed box car with steel under-frame and steel superstructure with wooden sheathing and (2), a double sheathed box car of all-steel construction including steel sheathing. The report referred to the report of the Committee on Car Construction, containing recommendations for standard box cars. It also referred to the circulars from the General Committee, recommending the adoption by the American Railway Association of the designs for standard box cars which have been approved by the required two-thirds majority by letter ballot. The drawings of the box cars recommended by the division were forwarded to the members with Mechanical Division circular No. DV-286. This report was referred back to the division for further consideration.

The second part of the report dealt with interchange rule 112 relating to the settlement for rebuilt cars when destroyed in interchange. The division reported that it had been found impossible to present a unanimous report on the subject. The report submitted gave in detail the previous history of the consideration of this subject and the conditions involved. Five members of the committee recommended the revision of interchange rule 112 to provide for a separate basis of settlement for rebuilt cars and five members of the committee objected to a separate basis of settlement for rebuilt cars and recommending that interchange rule 112 is equitable in its present form. This report was also referred back.

Report of Operating Division

The report submitted by this division supplemented a report made previously. It was reported that, as briefly referred to in the last report of the Committee on Operating Rules, a study of a large number of suggested changes in the standard code has been made. To handle this work properly, authority was obtained to appoint a sub-committee of three members to devote all of their time to the consideration of the numerous suggestions submitted. Careful consideration was given to all of the changes recommended.

On account of limited time, the committee was not prepared to submit a report on changes in the block signal and interlocking rules, other than of a general nature as to substitute the term, "restricted speed" for "caution." It is proposed to continue the study of the block signal and interlocking rules as well as of the advisability of consolidating the signal and double track rules which, in the majority of instances, are identical. When the committee's study of these subjects has been completed a detailed report will be submitted. In the meantime, certain changes in the standard code of train rules, block signal rules and interlocking rules, were submitted for consideration.



A Highway Bridge in Denmark

Automatic Train Control Hearing Concluded

Railroads Propose Joint Committee to Select Devices for Tests on Ten-Mile Sections

WASHINGTON, D. C.

THE HEARING before the Interstate Commerce Commission on the petition of 42 Class I railroads asking the annulment of the commission's order of January 14, 1924, requiring them to instal automatic train control, which was begun on May 7, was concluded on Saturday, May 17, with an hour of oral argument. The presentation of testimony by the train control representatives was begun at the afternoon session on May 14 and was to be concluded in a day and a half but after practically a day had been consumed by one company the hearing was extended for another day and an additional hour for argument was allowed to take the place of written briefs.

In closing the argument for the railroads C. C. Paulding (N. Y. C.) presented to the commission a specific proposition as follows:

We suggest that a joint committee composed of representatives of the commission and of the carriers be appointed to decide upon and select such additional train control and stop devices for test purposes as the joint committee by a majority vote may select as being substantially within the requisites of the commission and worthy of a practical test and that any member of this joint committee dissenting from the judgment of the majority be required to state in concrete and specific language his dissenting view as to any type selected by a majority of the committee for test.

That this joint committee, working under the supervision of the commission and of the carriers, be authorized on behalf of the commission and the carriers to employ, appoint and assign competent observers with the devices selected for test. These observers to submit full and complete reports to the commission and the carriers covering the performance of the devices under observation and their views, conclusions and recommendations.

That the provisions of the second order of the commission dated January 14, 1924, be vacated and set aside and that the provisions of the first order be amplified as follows:

(a) That the time for the installation of devices be extended to January 1, 1926, and that the installations already made or to be made under said order be subject to inspection and approval by the above committee when an installation of at least 10 miles of road and 10 locomotives has been made, and that complete installation thereof be dependent upon the report of the joint committee and the approval of the commission.

(b) That paragraph 1b under Provisions, covering automatic stops as recommended by the joint committee of the commission and the American Railway Association reading as follows: "b. Under control of engineman, who may, if alert, forestall automatic brake application and proceed," be restored without restrictions and without prejudice to the right of the commission to withdraw its approval should future experience warrant this course, and that provision 1b be made retroactive so as to include installations made under the first order dated June 13, 1922.

(c) That test areas and units for the new or additional devices recommended by the joint committee should be limited to a maximum of about 10 miles of road and 10 locomotives for each device; subject to agreement as to terms, etc., between the joint committee and the individual carrier.

These suggestions are made for the consideration of the commission and are intended to be without prejudice to the rights of the individual carrier to seek by agreement with the commission or otherwise other modifications of the order which may be deemed necessary or desirable to meet special or peculiar situations.

The testimony of representatives of train control companies and inventors of train control devices, besides including a history of the various test or service installations that have been made and descriptions of the apparatus, included much criticism and contradiction of the testimony of the railroad officers as to the effect of train control and particularly of the cost figures used by the railroads, which nearly every witness insisted were excessive. Several offered to contract to instal their devices, including everything they considered

necessary for service, for considerably less. Many took the position that there are several or even many devices available to the railroads which in their opinion would meet the requirements of railroad operation as well as the commission's specifications, but, under questioning by Commissioner Potter, some of them were unwilling to say that the commission would be justified in ordering a railroad to instal any device but their own.

The Regan Installation on the Rock Island

The first witnesses on the train control side of the case were called by George N. Brown, of counsel for the Regan Safety Devices Company. L. C. Fritch, vice-president of the Chicago, Rock Island & Pacific, was somewhat more enthusiastic regarding the Regan apparatus on the Illinois division of his road than was C. A. Morse, chief engineer, who had been called as a witness for the railroads. Mr. Fritch said it had been found practicable, reliable and satisfactory in every way, performing the functions required of it; and it does not limit the capacity of the line. Operation with it is safer than with automatic signals because it is positive, whereas signals are effective only when obeyed. The installation had cost \$235,789 and during the past three months the cost of maintenance, he said, had been at the rate of \$108 per mile per annum. Only two assistant signal maintainers had been added, and maintenance work is taken care of by the regular electrical employees. The locomotive engineers he had talked with seem to be well pleased with the device.

Under cross-examination by Fitzgerald Hall, of counsel for the railroads, Mr. Fritch said that he would make no further installation at this time unless required to, because money is needed for other improvements. He had no record of any accident having been prevented by the device but said that without question some have been, of which there is no record. He said the commission had approved the installation except as to a slight modification of the apparatus which can be made at once. If the engineer is alert he can press a button and forestall the operation of the device, Mr. Fritch said, and in his opinion this ought to be allowed. There had been no difficulty because of ice or snow on the ramp and no buckling of trains because of too quick application of the brakes. There had been some cases where dragging brake-beams had pulled out a ramp. He saw no reason why automatic control should make the engineer's job any more difficult on down grades, with proper air-pump capacity.

I. Lomore, passenger engineman on the Rock Island, described the device as a "little partner," and said that it had worked satisfactorily. Mr. Hall asked how many times he had failed to observe signals in the last 12 months and when he replied that he had not thus failed Mr. Hall asked how he knew that the device had worked satisfactorily. There was a good deal of confused discussion at this point, during which the witness said that he had run by a caution signal at a speed higher than that for which the speed control was set and it had then operated to reduce the speed. Also, the enginemen had been educated, he said, to use the device as a brake, at times, to slow down to 30 miles at a caution signal or to 10 miles at a red signal. The enginemen that use the device, he said, seem to think it is a great thing and he knew of no referendum on the subject ever taken by the Brotherhood of Locomotive Engineers. John C. Wood, freight locomotive engineer, also gave favorable testimony, saying that rather than decreasing his vigilance the apparatus

had increased it so that he is more careful of his speed in passing caution signals. He had experienced the application of the device when entering a caution block at a higher speed than that prescribed and the brakes had been applied in the same way that he would have applied them. F. J. Boyd, road foreman of engines, said that the device does everything it is expected to do; he had heard no expression of dissatisfaction from the enginemen, and according to the reports it works efficiently. He gave a negative reply to a question by Mr. Hall whether he had heard of enginemen on other divisions "crying for a little partner" and also to one by Mr. Brown whether any of those on the Illinois division are "shedding tears" because of the installation. E. Wanamaker, electrical engineer, said the device had worked satisfactorily.

Joseph Beaumont, vice-president of the Regan Safety Devices Company, described the device and its operation in detail, saying "it has operated in substantially perfect condition under all circumstances and in such a way as to elicit the outspoken commendation of enginemen and the executive and operating officials of the Rock Island." He also gave figures for which he said the Regan company would undertake to make installations on various roads that had given cost estimates, his figures being lower in every instance; but on cross-examination later it was developed that in some instances he differed materially in opinion from the railroad officers as to the amount of work necessary to complete an installation ready for service. Mr. Beaumont declared that there is no continuous induction device in actual service operation in the sense that the Regan device is operating. Witnesses have testified that there is no assurance that the continuous control type will work satisfactorily. Explaining some of the statements of the enginemen, Mr. Beaumont said that they might pass a signal at such a speed as to cause the speed control to operate without having violated any rule; the rules permit them to pass a stop signal at low speed if both the engineman and the fireman press release buttons. He gave the present cost of installing the Regan device ready for service, where signals have already been installed, at \$2,400 per mile of track, including one locomotive for each 4.16 miles; and \$2,934 per mile of double track; and, including signals, at \$3,700 per mile single track. He expressed the opinion that the use of a forestalling device without speed control is hazardous.

He read from reports made by the Rock Island to the commission which, he said, showed no false clear indications in January, February and March, 1924, but which showed 66 avoidable interruptions which careful maintenance would have prevented. There had been no false clears since the complete installation was made. Chairman Hall called attention to the showing in the report of 235 "interruptions and irregularities" in January, 195 in February, 189 in March and 104 in April, and asked if that did not mean that the device had not worked properly that many times. Mr. Beaumont refused to assent. Mr. Hall also referred to 31 improper operations by enginemen in one month, 14 shoes broken off in three months, and 11 times in March that trains were restricted as to speed when the block was clear, and asked the witness if the human element had been eliminated. Mr. Beaumont said it had as far as safety is concerned; that the breaking of shoes was due to natural elements, such as striking a keg of spikes.

Commissioner Potter questioned the witness closely as to his opinion of other devices and as to whether he would consider any other as justified for use by a railroad. When he finally said that he believed the Regan the only device that has proved itself to be thoroughly dependable and said that it is the only one that has been approved by the commission, Commissioner Potter asked: "Then the commission could not consistently require the use of automatic train control except for the fact that the Regan device is avail-

able?" Mr. Beaumont said he was only expressing his opinion. Commissioner Eastman referred to a statement made by Mr. Beaumont, as lecturer at a moving picture exhibition given before the commissioners some time ago, that the Regan company was prepared to supply the railroad with an induction type if they desired it. Mr. Beaumont said it is not now prepared to do so.

Referring to the testimony of W. L. Campbell, assistant to the vice-president of the Erie, as to the amount of the Regan company's bid for an installation, Mr. Beaumont said that the Erie had "padded" the figures to the extent of \$115,000 by adding that amount to cover some things that he said were included in the bid and some that the Erie had assumed to be necessary. Mr. Campbell declared that the Regan bid had omitted some things which the railroad considered necessary and which the other bidders had bid on, including 167 siding and crossing ramps, and that his testimony had included an amount for this. Mr. Beaumont insisted that the Regan company was prepared to obligate itself to make the complete installation for the amount of its proposal but Mr. Campbell took the position that the responsible officers of the Erie were the better judges as to what they would consider a complete installation.

D. H. Schwyer, of the Schwyer Electric & Manufacturing Company, said his company is prepared to furnish a two-position or three-position ramp type device or an inert element or a continuous control type and is willing to co-operate with the railroads and the commission and other train control companies in developing a satisfactory train control at a reasonable cost. Many devices, he said, have not been given a fair trial. Chairman Hall asked whether there had been an agreement among the train control representatives for an interchange of patents. Mr. Schwyer said it had been spoken of but that nothing had been done about it formally. Both the ramp and the induction types, in his opinion, hold out possibilities of development. He expressed the belief that the Regan is the best of the ramp type devices now installed but said that the Miller and Webb devices, with the addition of speed control, can also meet the requirements of the commission. Later in reply to a question he said there was no fundamental difference between his device and the Regan, but that they differ in details.

Sprague System

Frank J. Sprague, president of the Sprague Train Control & Signal Corporation, testified that he and his associates had expended about \$700,000 in train control development. He replied to some of the contentions of railroad witnesses, declaring that train control is clearly beyond the experimental or early development stage but is in the improvement stage, and that he had been surprised at the unfamiliarity with and misunderstanding of what has been accomplished displayed by some of the railroad officers, as indicated by statements that train control will take control of the train away from the engineman; and regarding loss of air on grades. He said the approval expressed by the railroads of a system which had been adopted by one company and practically forced on another, and the absence of testimony on the part of the signal companies in reply to the statements regarding the defects of their devices "might almost be called a conspiracy of silence." He wondered if the carriers "realize that their endorsement of this system to the exclusion of others may mean the failure of train control, or its postponement for another generation." There had been no real initiative on the part of the railroads toward developing train control until he was requested to co-operate in a test on the New York Central. He contrasted the extensive tests with the Sprague system on the New York Central with the tests on the Sunbury and Lewiston division of the Pennsylvania, where, he said, the trains are so infrequent that they can rarely

encroach on each other. Mr. Sprague thought that if the commission would withdraw its second order the development of train control would progress just about as fast under the first order.

Replying to Chairman Hall Mr. Sprague said he believed the ramp type is now obsolescent; nothing can be done with it that cannot be done at less cost without it. He believed he was a better airbrake expert than many of the witnesses who had testified; there is no excuse for an engineman that is alert ever having any automatic application of his brakes. Mr. Hall remarked that if every engineman always did what he ought to there would be no need of train control, to which Mr. Sprague replied that there would be no need of prohibition if every one did what he ought to do. The chairman asked if train control is expected to work about the way the Volstead act does.

For the proposed installation on the Mohawk division (N. Y. C.) the air brake men insist on 8,300 ft. braking distance, which Mr. Sprague did not agree was necessary. In reply to Commissioner McChord, Mr. Sprague said he did not approve of the continuous induction type and that every piece of that apparatus put on in the last nine months has been declared obsolete. It is necessarily a complicated apparatus, and in its present form depends on an extraordinarily fine balance of electric forces, which he thought could not be maintained satisfactorily in railroad service. The Sprague company now has contracts with the Chicago, Indianapolis & Louisville, the Chicago, Burlington & Quincy, the Great Northern and the Northern Pacific, and while it supplies no wayside material, making a unit price for equipment, which covers co-operation with the railroad in making the installation, the cost per mile of track on 25 different bids had ranged from \$1,300 to \$1,900.

J. F. Webb, Jr., of the International Signal Company, testified regarding various tests on the Erie and the Delaware, Lackawanna & Western of the Webb ramp device, which he said makes a smoother stop than the engineman does and within a shorter braking distance than has been declared necessary by those opposed to train control. He said the cost is about \$446 per mile and \$700 per locomotive. He did not believe in the permissive release.

The Miller Installation in the C. & E. I.

W. B. Murray, chief engineer of the Miller Train Control Corporation, described his installation on the Chicago division of the Chicago & Eastern Illinois where it has been in regular service since 1914 and where, although the density of traffic, wide range of train equipment and variations of speed impose severe operating conditions, the control has performed its functions satisfactorily. During the nine years to November 17, 1923, he said, there have been 13,000,000 control movements and in handling the vast number of all classes of trains including long and heavy freights, the automatic application of the brakes has not resulted in damage to equipment; the engineman's responsibility is not lessened and automatic train control does not interfere with the correct handling of the train. No specially trained men are necessary to maintain the control; the regular signal maintainers and track men look after the roadway equipment, and the shop mechanics make all repairs on engines. Locomotives have never been held out of service to apply equipment. Ramps are very rugged and after 10 years of service show little or no wear. Heavy snows, sleet and ice storms and extremely low temperatures have prevailed during the winter months. Ramps have been covered with sleet and ice, but no interruption was caused and extremely low temperatures caused no freezing or other damage to the apparatus. "The Miller train control has conclusively proved that it does operate successfully under all weather conditions which permit train movements."

In order to comply with the Interstate Commerce Com-

mission's order a positive stop valve has been developed and perfected, which holds the brakes applied until the train has come to a full stop. The engines are now being equipped with these standard instruments and 50 engines have been equipped. The Miller company has received a contract from the Elgin, Joliet & Eastern to equip certain of its engines which run over C. & E. I. tracks in train control territory. At present prices the installation on the C. & E. I. would cost approximately \$105,000 for 114 miles of double track and from \$550 to \$800 per engine. Mr. Murray thought that the railroad would be ready to ask final approval of the commission for the installation in about 45 days.

Mr. Murray's statements were in no way challenged either by the commission or by the railroad counsel on cross examination. Examiner Curry asked him whether he considered the permissive feature desirable and Mr. Murray replied that from the operating standpoint he felt that it is very desirable but that from the safety standpoint it is not.

Wooding, Brookins and Others

Dr. B. F. Wooding described tests of the Wooding automatic train control made on the Delaware, Lackawanna & Western in 1917 regarding which a report to Congress was made by the Division of Safety, and said that each of the train control committees has included it as among those that have passed the experimental stage during the past ten years; but, he said, this simple, practical device has been thrust into the background by the influence of the signal companies, which, he said, have always been opposed to train control.

A. J. Brookins, of the Brookins Railway Control Corporation, said his device had been approved as to principle by the Bureau of Safety but that he had been unable to get a test on a railroad.

Miss Pearl Kramer read a statement for Charles M. Hurst, president of the Hurst Automatic Switch & Signal Company, describing his invention.

C. W. Hudson described the Hudson Train Control which was recently given a test for six weeks on a side track on the Richmond, Fredericksburg & Potomac near Washington. This uses a 30-ft. ramp bolted to the rail and a wheel contactor.

E. H. Abadie, vice-president of the Standard Train Control Company, described the tests made several years ago on the Southern of the device patented by Joseph W. Buell.

R. W. Richards, president of the Richards Train Control Corporation, described his device, which includes speed control and cab signals, which he said has not been installed on a railroad but is now ready for a demonstration. The company is now prepared to make a test installation at its own expense or to make contracts for complete installations.

A. B. Galt, of the Warthen Train Control Corporation, said that his system can be furnished for \$1,800 per mile. It has tried to get an opportunity to make an installation at its own expense.

E. H. Abadie made a brief statement for the "Associated Train Control Corporations," which association, he said, was formed to help the industry, act as its spokesman and be the representative body through which the train control companies can act on matters of common interest. It has 11 train control proprietors as members.

Each of the 42 roads which appealed from the Commission's second order had the opportunity to make a separate statement, supplementary to the general argument of counsel; and 30 or more of them did so. Most of these statements were short though one, that of the Denver & Rio Grande Western, occupied about an hour.

Government Records

W. P. Borland, director of the Bureau of Safety, and other witnesses representing the commission filed for the

record a number of statistical exhibits, including a list of collisions in block signal territory due to the failure of the engineman to observe signals. This covered 111 collisions in which 510 persons were killed, over 4,000 were injured and the property damage was over \$1,000,000. A report of the joint inspectors of the American Railway Association and of the commission covering the installation on the Rock Island, filed by Mr. Borland, showed three false clear indications. C. A. Lyon, of the Regan Safety Devices Company, took the stand to testify that the company contends that in two of these cases the evidence was not sufficient to classify them as false clears.

Closing Arguments

In the concluding argument on Saturday Mr. Hall, railroad attorney, said that the railroads have not the money; but that if they did have it, in their judgment, they could spend the amount required for train control to better advantage in other directions, where it would produce more direct results in the way of safety or reduce operating expenses and make for greater efficiency. "That the devices have been pretty far advanced mechanically is admitted," he said, "but what they will do on heavy grades and under many other conditions no one knows. Train control has been installed on the Rock Island and its officers say it has worked satisfactorily; but they don't want any more. It has averaged six failures, of some kind, for every day. The Chesapeake & Ohio tried it for eight years and does not want any more. Neither does the C. & E. I. We are not going to get rid of the human element; as long as men make appliances and maintain them, they may fail. All we do is to transfer the responsibility from the locomotive engineers, probably the highest trained class of railroad employees, to the signal maintainers. The railroads have been diligent and have expended a great deal of money to develop train control but they are not satisfied as to what the results will be or as to which devices they should try. This is primarily an operating problem, and the railroad managements know more than any one else about how to run a railroad. "In its broad aspect the question is, Who is going to run the railroads; those who know how or those who do not? It is their combined judgment that we should not proceed at the speed suggested by the two I. C. C. orders. Many believe we are going to solve the problem; but we ask the commission to make haste slowly, wisely, and intelligently. We believe the railroads will do better if not forced to make general and widespread installations."

George N. Brown, representing the Regan company, said the fundamental question is the safety of the traveling public and the obligation of the railroads to the public. "We know there is a practicable, economical and workable device giving satisfactory service every day on a busy railroad. I do not charge that there is a conspiracy against the ramp type but the conditions we are confronting are much the same as if there were such a conspiracy. In the record is unmistakable evidence that the carriers are not in favor of automatic train control at this time. There has been an effort here to mingle the two cases in an effort to modify the old order. This is playing horse with an order of the commission to an extent never before heard of. All objections to train control have been answered even by the testimony of railroad witnesses. Continuous induction control is still in its infancy but the carriers insist on spending their money for that rather than for one that has been proved. The carriers are working to destroy any train control. Their estimates of prohibitive cost are brought forward to defeat the efforts of the commission to carry out the law."

C. A. MacHenry, of the Hudson Train Control Company, spoke on behalf of a number of the smaller companies. It may be conceded that there is no such thing as train control if reference is made to the kind the railroads say they want; but there are many that could be installed of the

intermittent electric type, that have been approved by the commission. "The railroads have chosen what does not exist and some competent engineers say may never be perfected; some engineers say they will get it; others, equally competent, say that two years from now continuous induction will be a bad dream to a good many signal engineers. The railroads and the signal engineers have tried to make an intricate problem out of one that is simple."

Mr. Paulding said the railroads are not opposed to train control. They have been working, some of them for many years, through committees of the best men they could get, to develop a system that will be practical and workable under the conditions of the various railroads. He pointed out, however, that what is sought is an improvement on the work of what is perhaps the most perfect machine on a railroad, the locomotive engineer, and the next perfect, the automatic signal. Our experience has shown us conclusively that the development of the art of train control is in a state of flux. Many of us have made contracts to comply with the provisions of the first order and we have yet to learn the results. It is one thing to say that a device works all right on a few locomotives and a few miles of track but it is another thing to say that an installation on 500 miles and 350 locomotives under the conditions obtaining will work perfectly or properly. The only way it can be ascertained is by trying. If those installations prove practical and successful no one will be better pleased than the railroads." Mr. Paulding then outlined the proposal for joint tests.

The commission has denied a petition filed by the Cincinnati, New Orleans & Texas Pacific and the Southern for a reopening of its train control proceeding and cancellation of the order of January 14.

Carriers to Have Access to Certain Valuation Data

WASHINGTON, D. C.

IN ACCORDANCE with the suggestion made by the Supreme Court in its decision denying the St. Louis Southwestern a writ of mandamus to compel the Interstate Commerce Commission to permit carriers to inspect its valuation records, the commission has now issued a modified order permitting access under certain conditions to some of the data. The court said that "in such way as may be found practicable the relator should be enabled to examine and meet the preliminary data upon which the conclusions are founded and to that end should be given further information in advance of the hearing sufficient to enable it to point out errors if any there be. The commission's new order states:

And Whereas, the opening of all data in all cases to examination by persons not parties to a proceeding and of those parts of the data in a particular case which are not under protest will greatly hinder and delay the commission in performing its duties in valuing the railroads as required by Section 19a of the Act; *Therefore*:

The commission finds, That the data gathered by the investigation by the commission in making its tentative valuation and which are, in the discretion of the commission, subject to examination by the carriers or other parties to the proceedings are as follows: (1) In the Accounting Section, copies of contracts or parts thereof and summaries of the contracts, records and accounts of the carriers, and the supporting details thereof, constituting the data upon which appendix 2 to the tentative valuation report is made up; (2) In the Engineering Section, the classification of the carrier's property, the pricing sheets (Form 562), returns to Valuation Order No. 14, extracts from records furnished by carriers, copies or abstracts of contracts and final estimates, catalogues and price lists furnished by manufacturers, upon which data, aided by personal inspections and examinations of the properties by experts of the commission, the costs and depreciation of properties of carriers have been estimated and upon which the underlying engineering reports have been made; and (3) in the Land Section, the written reports, commonly known as field notes, made by land appraisers upon blanks furnished them, on which

are recorded sales, assessments, names and addresses of persons giving opinions to the field appraisers in specified districts and zones; the field maps showing zone lines, descriptions of adjoining property and location of sales; sheets showing statement of classification and areas by zones; and copies of deeds and contracts, from which written data, aided by personal inspections and examinations of the properties by expert appraisers of the commission, the lands have been classified and valued.

It is therefore ordered, That upon application in writing, stating the name of the carrier, valuation docket number, and requesting the data specifically pertaining to items specifically protested, the carrier or other party to the proceeding arising from protest filed against a tentative valuation, may, as soon as practicable after such application, by its duly authorized attorney or agent, examine such parts of the data above described as pertains to matters specifically protested. Such examination shall be made at the office of the commission, Washington, D. C., and shall be made during the official business hours, in the presence of an employee of the commission.

The order heretofore entered on October 9, 1922, is continued in full force and effect, except in so far as it is inconsistent with the new order.

Hearing on Consolidation Bill

WASHINGTON, D. C.

A MENDMENT of the consolidation provisions of the transportation act in order to promote voluntary consolidations of railroads in the near future and to hold out some inducements as well as pressure upon the railroads to carry out a plan of consolidation were urged upon the Senate interstate commerce committee by Secretary Hoover, of the Department of Commerce, and John E. Oldham, of Boston, at a hearing on Senator Cummins' consolidation bill on May 21.

Discussing the plan proposed by the bill for forming committees to work out plans for the exchange of securities, Mr. Hoover said that when a concrete plan is worked out in this way there is always a tendency for the security holders to accept it as being the only way out and the federal holding companies to be created would thusly change their stock for the controlling stock and ultimately all the equity securities of the separate railroads. The act provides three stages of pressure upon railroads to consolidate in accordance with the commission's plan but he believed that the railroads would come in at the first stage in most cases without waiting for the exercise of pressure and "we would thus get a considerable degree of coagulation of the railways in a short time."

Consolidation would automatically redistribute any excess net income among the weak roads of a system, he said, and Senator Cummins pointed out that the recapture provisions were intended only as a temporary method of bridging over the gap until consolidations could be effected.

Mr. Hoover pointed out that in working out plans for the exchange of securities it would be possible to issue them in ratios somewhat comparable to market values and thus get a considerable reduction in capitalization, perhaps to a figure somewhat below the I. C. C. valuations in some instances, although he could not make that a universal rule. He also said that consolidations would offer greater opportunity for a general readjustment of rates. The question of the number of systems to be created needs exhaustive inquiry but he believed it entirely possible to equate the earning capacity and returns of the railroads. He thought it would be a great advantage if a period of two years were to be allowed before the Interstate Commerce Commission's plan is promulgated during which the commission would be authorized to permit voluntary consolidations. Many consolidations which are right and logical and would fit into any plan would come with great rapidity if this opportunity were offered, he said. Mr. Hoover thought federal incorporation a very valuable addition to the whole project as it would dis-

entangle a multitude of difficulties arising from state incorporations of roads and parts of roads and offer an opportunity to "get rid of a tremendous corporation complex."

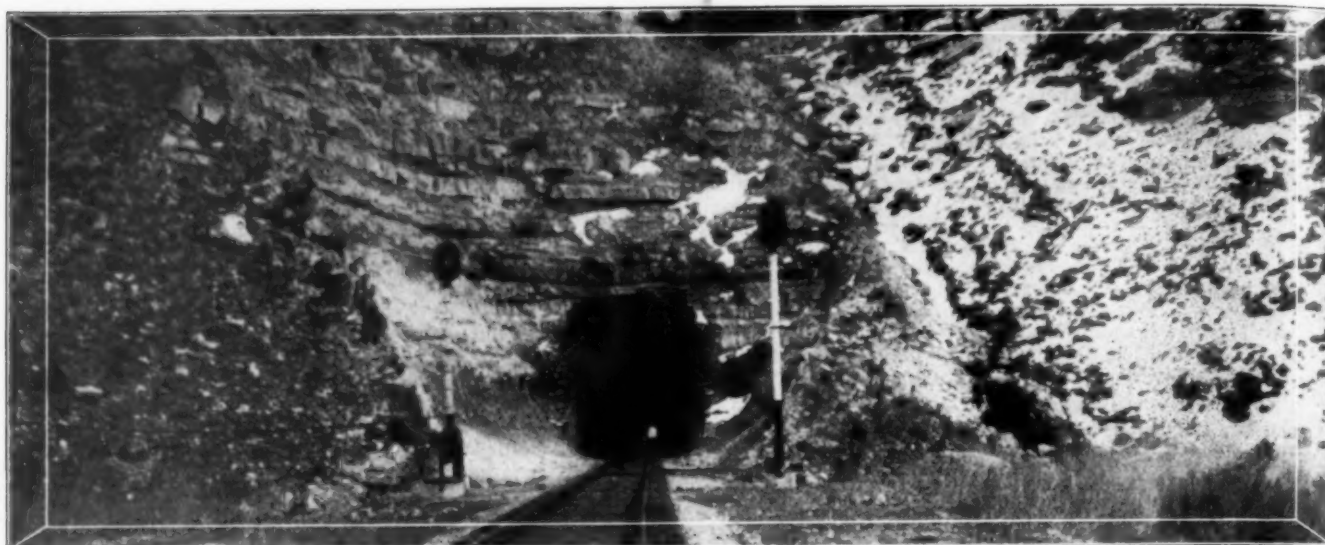
Senator Gooding asked what a consolidation plan has to offer in the way of reduction of the cost of transportation. Mr. Hoover said that the possibility of providing adequate service is even more important than any possible effect on rate reductions, as the increase in prices imposed by strangulation of transportation at times amounts to much more than the rate consideration. He said that in 1920 the public paid an excess of \$3 to \$4 a ton on perhaps 300,000,000 tons of coal because of the shortage of transportation. "If we can get a strong structure set up," he said, "we are more likely to get adequate service."

Essential for Effective Regulation

Mr. Oldham said that the grouping of railroads into a few well organized systems is essential to any effective policy of government regulation. No system of regulation can be devised to deal with the railways equally so long as railways differ so widely in so many respects as they now do, he said. The transportation act was designed to meet average conditions, and the creation of systems of average or uniform character, so that they could employ uniform rates and earn substantially uniform return, was the purpose of Congress. As the hearings before the Interstate Commerce Commission have progressed there has been an increase in confidence in the feasibility of consolidation and of resuming under public regulation the process which built up systems like the New York Central and the Pennsylvania, which process was interrupted by law, and the ultimate creation of a national transportation system composed of strong units, he said. However, he continued, there is apparently little prospect of further consolidations in the near future until the transportation act is amended in some such way as proposed by the Cummins bill to authorize the commission to adopt alternative plans and to approve any consolidation it deems to be in the public interest in advance of the completion of its plan. He expressed the opinion, however, that perhaps more time ought to be allowed than the bill provides for railroads to work out voluntary consolidations before the committees contemplated by the bill begin to function. Senator Cummins said he was afraid that the commission's plan would be promulgated before there could be any legislation on the subject. Mr. Oldham said he believed that with the bill voluntary action would accomplish the greater part of the work without the necessity for the work of committees. In conclusion he agreed with Senator Cummins that private ownership could not long continue unless "we can have effective service, which we cannot have so long as the system of regulation produces such different results on different railroads."

Wilbur LaRoe, Jr., associate counsel of the Port of New York Authority, supported the provisions of the bill authorizing the I. C. C. to omit terminal properties from its plan or to attach such conditions to the use of terminal properties as to insure their joint use.

CHARLES M. SIMPSON, president of the Montana Stock Growers' Association, has shipped cattle from Montana to Chicago over the Northern Pacific and the Chicago, Burlington & Quincy, for 36 years without filing a claim or making a complaint. From his ranch at Volborg, about 60 miles south of Miles City, he has shipped a few trainloads of fat steers every year and has never shipped less than one trainload. From a small beginning he has acquired thousands of acres of range and large herds. He says that as the packers, the stockyard companies, the livestock exchanges and the railroads "are the medium through which we market our livestock I think we should refrain from constantly throwing a monkey wrench into the machinery of these organs."



Tunnel Protection is Furnished by Signals

New Signals on Burlington Expedite Traffic

Delays Reduced From 15 Minutes to an Hour by
Replacing Positive Block with Automatics

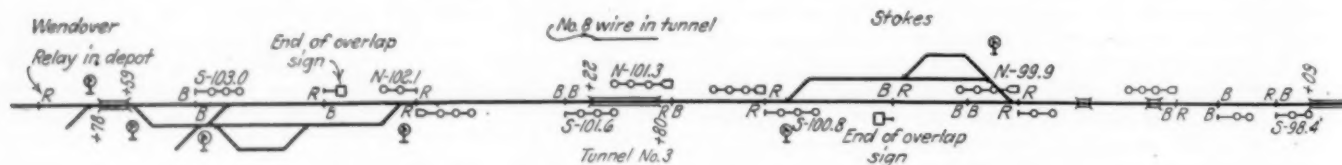
A COLOR-LIGHT automatic signal installation was recently completed and placed in service on the Chicago, Burlington & Quincy between Guernsey, Wyo., and Wendover, a distance of 8.3 miles, to supercede the positive manual block system which was formerly in use between these points, and to speed up and facilitate operation. The installation is on that line of the Burlington running from Alliance, Nebr., through Northport to Guernsey, Wyo., Wendover, Casper, Thermopolis and Billings, Mont. The Colorado & Southern line, from Denver north, connects with the Burlington at Wendover and has trackage rights to Guernsey where the Burlington has a yard and roundhouse facilities.

The need for this stretch of A. P. B. single track signaling is readily apparent from the fact that, in addition to the Burlington's heavy freight movements of oil and coal over this line, the Colorado & Wyoming railroad delivers iron ore from Sunrise, Wyo., to the yard at Guernsey where the C. & S. picks it up and hauls it to the smelters at Pueblo, Colo., via Wendover and Denver. Between Guernsey and

Wendover, under the positive block formerly in use trains were frequently delayed at Guernsey or Wendover from 20 min. to an hour or more by trains ahead before the block was cleared. After the installation of the automatic signals, the delay to following trains has been reduced to about five minutes. This has relieved the congestion at either end considerably and speeded up train operation decidedly.

From Wendover to Guernsey, the line follows along the south bank of the North Platte river with considerable curvature. There are three tunnels in this 8.3 mi. stretch, as this is in the foothills of the Big Horn mountains. There is one siding with a capacity of 96 cars at Stokes, 5.1 mi. west of Guernsey and 3.2 mi. east of Wendover, but this could not be used to advantage as a meeting point under the positive manual block since there is no office at that place, but only a telephone connected to the dispatcher's line.

There are six telephone locations in this territory, five of which were formerly in service, while one was added at the west end of Stokes passing track when the signals were installed. These telephones are connected to the dispatcher's



Track Diagram Showing the Location of Signals, Tunnels and Other Characteristics

Wendover about 8 C. & S. trains are operated daily when business is light, which number increases to approximately 15 when business is heavy. The Burlington has an average of 13 trains a day during periods of light traffic and about 25 when business is heavy. This gives an average movement of from 21 to 40 trains or more a day over this territory, depending on traffic conditions. The average running time of passenger trains between Guernsey and Wendover is 20 min. while that of freight trains is from 50 min. to one

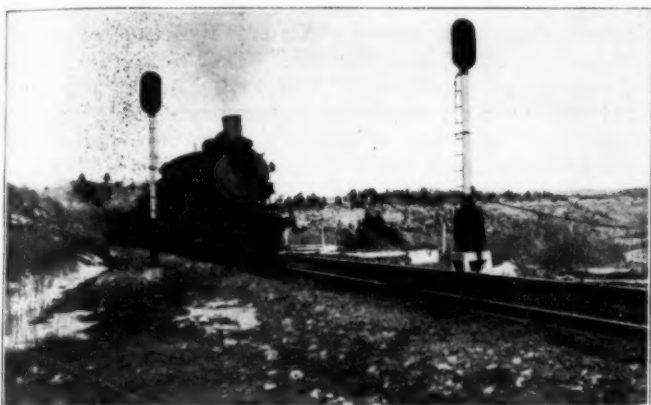
circuit and are located at the west end of Guernsey yard; at the west end of tunnel No. 1; at the west end of tunnel No. 2; at the east end of Stokes passing track; at the west end of Stokes passing track and at the east end of Wendover yard.

Tunnel Protection

The home signal control wires have been carried through all tunnels and are mounted on brackets attached to the side walls. Knife switches are located at each end of each

tunnel and the control wires are broken through them so that, in cases of emergency, trainmen, section men or others can open the switches and put the home signals at red on each side of the tunnel. If a train should be stopped for any cause in a tunnel at some distance from the knife switches, all that is necessary is for the train crew to cut the wires alongside and this will serve the same purpose as the opening of the knife switches. The signal control circuits are carried through the tunnels with No. 8 Okonite copper wire having 3/64 in. wall insulation.

Two and three-position Federal Signal Company's color-light signals are used throughout this installation. The



Double Signal Location at the West End of Stokes Siding

Burlington's standard signaling scheme is followed in that separate home and distant signals are used, which practice is in line with the two-position lower quadrant, home and distant signals in service on other parts of the system. A 220-volt power line extends from Guernsey to Wendover with power furnished from a generating unit located in the Guernsey roundhouse. The storage batteries at signal, cut and track locations are on floating charge across Valley rectifiers.

The Power Plant and Pole Line

The system of power distribution is unique in that instead of power being purchased from commercial companies, the Burlington installed a Delco lighting unit in the roundhouse at Guernsey. In this part of Wyoming there are few commercial power company lines near the railroad right-of-way from which power can be purchased for the operation of a signal system, and this made it necessary for the company to provide its own source of power.

The unit is self-contained and in connection with its power

signal wires are carried on the bottom cross arm which is a 10-ft., 10 pin arm. The power wires are located on the field and track pins, and the signal wires are placed on the intermediate pins between the two power wires. In this territory, the Western Union line goes over the tunnels and across country instead of following the track. As a consequence, it has been necessary to build stub lines in from the main lead to certain signal and other locations. These stub lines were carried to a point where the main telegraph line would ordinarily be located, and cable was used from this point to the signal locations. The regular open line wire construction was employed on the stub lines.

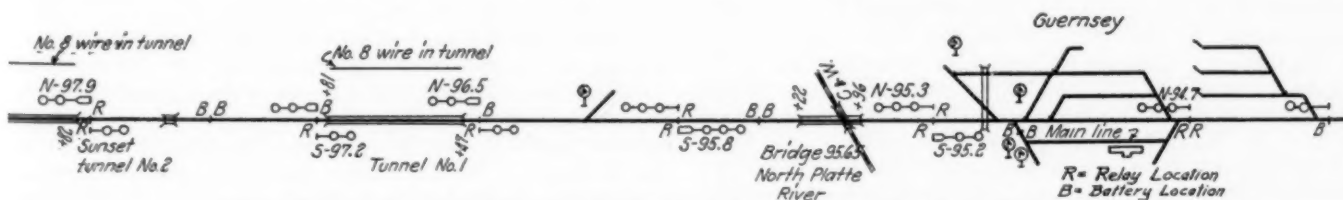
As an emergency source of power, arrangements were made with the local power company at Guernsey to furnish current at night. The local company generates current at 60 cycles, 115 volts and for the emergency source of power, leads are taken off the station meter, wires being carried to the telegraph pole nearest to the station where the current is stepped up to 220 volts for transmission on the line. Current is generated in Guernsey from dusk to daylight except on Wednesdays when it is on until noon. There is a telephone line between the roundhouse and the station and in case of a breakdown of the regular power plant, the roundhouse attendant can telephone the railway station to cut in the emergency power; this, the operator at the station can do by throwing a switch located in the depot for this purpose.

Signal Arrangement

The track layout shows the location of the signals. The signals are 18 ft. high, and are equipped with 8-volt, 18-watt lamps. The lenses are 8 3/4 in. in diameter and have a spread of approximately 10 ft. in 1,000 ft. The signals are mounted on Burlington standard signal foundations. The signal poles on the line side of the track are supported on standard mechanism cases with doors on the two sides and with the case divided in the center. The rectifiers, light relays, terminals, fuse blocks and fuses are mounted in the side of the case next to the line. The side of the mechanism case next to the track houses the track and signal control relays, terminals, signal lighting circuits and variable track resistances. The signals on the opposite side of the track from the pole line have no mechanism cases.

No trunking is used on the installation as all connections from battery well to signals, across the track between signals and track connections are made with No. 8, two-wire Parkway cable. Aldoseals are used at the signals located on the opposite side of the track from the pole line for the termination of the parkway cable. The light wires are then carried from the Aldoseals up to the lamps in the signals.

All starting signals (or stop and stay signals) are permanently lighted and the approach lighting scheme is used on



Track Diagram Showing the Location of Signals, Tunnels and Other Characteristics

board, is cared for by roundhouse attendants. The generator delivers approximately 5 amp. to the line, which is sufficient to operate the entire signal system, and also provide for all losses in line and transformers. The power is generated at 115 volts and is stepped up to 220 volts through a transformer, located just outside the roundhouse.

A signal department power line, approximately one-quarter mile long, was constructed from the roundhouse to the Western Union main lead. From this point on, the power and

all intermediate signals. Valley light relays are used at all permanently lighted signals with transformers having a ratio of 220 to 8 volts, there being 6 in all. The 220-volt circuit is carried direct to the mechanism case and attached to the transformer at these locations.

Four cells of Exide Type KXH7, 80 a.h. storage batteries are used for the signals and one cell is employed on the track circuits. These cells are housed in Massey circular battery boxes. The Parkway cable is taken in the trunking

entrances and terminated on a terminal board inside the battery box and the trunking entrance is then cemented up. No variable track resistances are located in these boxes, but they are placed in the mechanism cases where they are more readily accessible.

Where relay and track feeds are located, a cable post with a four-way relay box is used for housing the rectifiers. There are no relayed cuts in the tunnels. Copper-clad bond wires and duplex channel pins are used throughout on the track circuits. The terminal boxes for the boot-leg connections are mounted on wood stakes and contain two R. S. A. terminals to which the Parkway cable is terminated; these boxes are filled with a sealing compound after the connections are made. The Parkway cable for the track or signal connections requires no trunking which makes it easier for section gangs to replace or tamp ties or do other work at these locations.

Switch and Station Indicators

The switch indicators are of the 500-ohm, push button, semaphore type. Light indicators, however, are used for the information of the operators and are located in the stations at Wendover and Guernsey. These indicators are arranged so that they are controlled by strap keys on the operators desks. It is necessary for the operators to push the keys, if the indicators light up it signifies that a train is approaching. The switch boxes throughout the territory are equipped with a self-centering device so that if the connecting rod should be broken or other parts become deranged, the contacts shunt the track circuit, thus putting the signals governed by that particular track circuit at danger.

The engineering details of this installation were worked out under the direction of J. B. Latimer, signal engineer, and the installation was made by railroad company forces under the direct supervision of W. F. Zane, assistant signal engineer.

Railway Development Meets Association at Savannah

DISCUSSION of the broad general principles underlying railway development work, rather than of the technical problems, marked the sixteenth annual meeting of the American Railway Development Association, which was held in Savannah, Ga., May 14, 15 and 16. The attendance was large and enthusiastic, and besides the general sessions there were sectional meetings of the three principal groups, the agricultural, the industrial, and the public relations.

The Atlantic Coast Line, the Central of Georgia and the Seaboard Air Line acted as hosts and provided an entertainment program for the delegates and the many lady visitors. At the opening business session eight new members were elected and the roll call showed the death of three during the past year: D. H. Hagerman (P. R. R.), Jesse M. Jones (S. A. L.), and C. L. Smith (O.-W. R. R. & N.).

The policy of the national government toward reclamation was outlined by Honorable William B. Bankhead, member of congress from Alabama. Mr. Bankhead pointed out the opportunities for service of railway development men in this connection.

The state of public sentiment toward the railroads was the subject of interesting reports by D. E. Willard (Great Northern), J. L. Cobbs, Jr. (Atlantic Coast Line), and R. S. Henry (N. C. & St. L.). The summing up of these surveys by public relations specialists indicated that the people believe today that railway service is excellent and are disposed to give full credit to transportation for efficient operation. It is the thought of the investigators, however,

that certain matters need to be explained more clearly to the public. Chief among these is the difficulty of railway financing. There is apparently a general impression that the railways are making plenty of money, and a lack of sympathy and of an understanding of the necessity for the firm establishment of railway credit as a prerequisite to the expansion needed to keep pace with the country's progress. There is also a widespread demand for freight rate reduction, particularly on agricultural products, and the speakers had found a general discontent at the Pullman surcharge.

L. A. Downs, president of the Central of Georgia, was the principal speaker at the annual dinner on Thursday evening. His own experience in railroading had been mostly in the operating department, but he was now ready to list the development department as one of the essential branches of the organization. He stressed the need of intelligent and scientific methods of procedure in development work, and suggested that an alert development department, with experts versed in the knowledge of industry, agriculture and realty, would prevent costly errors of judgment on the part of executives. New traffic must be developed, to justify the mounting cost of operation and increased taxation, and the development agent can assist in solving the traffic problems that come before the executives. Illustrating the general principles laid down he referred to the peach industry as an example of intelligent co-operation, in which the Central had led; the researches and tests which had been made to prove the availability of Georgia clay for use in ceramic and other industries, and the test pastures of the Central's agricultural department. President Downs urged the development men to give attention to the creation and maintenance of public good will. The legislative situation at Washington calls for the best efforts of all transportation men.

The topic of Dr. Andrew M. Soule, president of the Georgia State College of Agriculture, was "Relations between railroad agricultural men and other forces working for better agriculture." He had found that a closer bond of sympathy and co-operation was continually being developed between these two great representative building agencies.

B. Mifflin Hood, of Atlanta, a manufacturer of brick and tile, spoke of "Research as a factor in agricultural and industrial development." He stressed the need of a scientific study of opportunity. He inclined to the belief that manpower was the most important factor in development, and stated that the educated man with vision and knowledge could bring about great progress.

The methods of city commercial organizations for promoting industries, the development of the poultry industry, the operation of agricultural demonstration trains, the problems of nation-wide co-operative marketing, the place of the railway magazine in public relations work, and the co-operative marketing of farm products were the principal subjects discussed in the general sessions.

San Antonio, Texas, was selected as the place for the next meeting, which will be on Wednesday, May 13, 1925. J. F. Jackson, General Agricultural Agent of the Central of Georgia, who has been acting president since the retirement from railroad work of Mr. Fox, of the Northern Pacific, was chosen president for the coming year. A. Leckie, Industrial Agent of the Kansas City Southern, Kansas City, Mo., was made first vice-president, and W. H. Hill, Agricultural Agent of the New York Central Lines, Chicago, was promoted from the secretaryship to the second vice-presidency. A. L. Moorshead, Industrial Engineer of the Erie, New York City, was chosen secretary-treasurer.

THE NEW YORK CENTRAL is to run a special train from Chicago for the members of the American Association of Railroad Superintendents going to their convention which will be held at Buffalo on June 18-20. The train will leave Chicago about 8:30 the morning of June 17.

Progress on Railroad Legislation in Congress

Gooding Long and Short Haul Clause Bill Passed by Senate—Labor Bill Goes Over to June 2

WASHINGTON, D. C.

RAILROAD LEGISLATION has occupied a large share of the attention of Congress during the past two weeks. The Senate on May 19 passed by a vote 54 to 23 the Gooding long and short haul clause bill, after a week of debate in an unsuccessful effort to attach it as a "rider" to the War Department appropriation bill. The Barkley railroad labor bill was debated for ten hours in the House on the same day but without conclusion and its consideration went over until June 2. There has also been some debate in the House on Representative Shallenberger's motion to discharge the committee on interstate commerce from consideration of the Huddleston bill to repeal section 15a and to restore the rates in effect prior to the passage of the Transportation Act, but he has thus far obtained only about 30 of the 150 signatures to the motion necessary to make it effective and the committee was to meet on Thursday to consider the bill. The Senate committee held a hearing on May 21 on Senator Cummins' bill to amend the consolidation provisions of the transportation act and Chairman Smith on May 20 reported out of the committee a bill S.862 to abolish the Pullman surcharge.

The committee on May 21 began hearings on section 15a and the House now has before it a favorable report from the committee on the Hoch resolution providing for a readjustment of freight rates. However, if the announced intention of adjourning Congress on June 7 is to be carried out the time is getting very short for the passage in one house of Congress of a bill referred to it by the other in a different form. Representatives of the "progressives" are talking about delaying an adjournment until some of the bills in which they are interested are passed and much may depend on their willingness and ability to carry out a filibuster against the appropriation bills to prevent an adjournment. On the other hand many of them are understood to be as anxious as the others to get back home. The Senate committee on interstate commerce has not yet taken any action as a result of its hearings on section 15a nor on the Howell-Barkley bill, although the sub-committee to which the latter was referred has proposed an amendment to give the President authority to institute receivership proceedings against a railroad on which there is a strike.

Labor Bill Postponed

The Barkley bill came up for consideration on May 19 under a motion which had been passed two weeks before providing for three hours of debate on the bill and five-minute speeches on amendments. The first motion taken was to take up the bill as in committee of the whole, which was carried by a vote of 203 to 180. Chairman Winslow, of the committee on interstate and foreign commerce, said that Congress was being asked to pass the bill with its eyes shut, not because the great masses of the people have asked it "but because organized labor, represented by four great brotherhoods plus a lot of little labor organizations are saying, 'We want it, that is enough; we will have it.'" Those who favor the bill have urged in one way and another, he said, that a great propaganda of the great interests are flooding Congress with suggestions and statements that they do not want the bill passed, "but we do not want people who are forcing this bill along to undertake to make the public believe that they are the fair-haired boys who would not exert legislative influence, and that the men who have the money in-

involved are the wicked devils who are trying to postpone the consideration of this bill."

Chairman Winslow then asked the clerk to read a communication which came into the hands of at least one member of the House, addressed by Warren S. Stone of the Brotherhood of Locomotive Engineers, to the general and local officers of the brotherhood, stating that "a deluge of telegrams from now until May 19 will do much to strengthen our position and our opportunity for the enactment of this bill." He also showed a bunch of petitions from independent orders of railway employees, opposing the legislation, and a sample of letters sent out by System Federation No. 90 on the Pennsylvania lines to those who had voted against discharging the committee, demanding that they change their votes. Representative Nelson then read some communications indicating activity against the bill by railroad attorneys and members of the Railway Business Association. During the debate there was nearly as much discussion of the propaganda on both sides as of the bill itself.

Representative Cooper of Ohio, who has introduced a bill to abolish the Railroad Labor Board, which follows in many respects the provisions of the Barkley bill, but without the four national boards of adjustment, offered it as a substitute for the Barkley bill. Representative Barkley also announced his intention to offer an amendment to meet some of the criticisms made of the bill by allowing any representative organization to submit names to the President for appointment on board No. 4 instead of confining the representation to those nominated by the national organizations.

Representative Sanders moved to strike out the enacting clause of the bill, which was carried, 144 to 134, after which Representative Longworth moved to refer the bill back to the committee on interstate commerce and to adjourn, but both motions were rejected, 170 to 211, and 181 to 201. The next question was as to whether the House would concur in the recommendation of the committee of the whole to strike out the enacting clause. During the debate on this point there were many roll calls on calls for a quorum and motions to adjourn but the motion to concur was finally defeated, 160 to 188. It was then about 10:00 p.m., and Representative Barkley said it was apparent that the consideration of the bill could not be completed because of the efforts to block its consideration by those who were opposing the bill on the ground that it had not received proper consideration. Under the rules the bill goes over to June 2.

Gooding Bill Passed by Senate

The Gooding bill, S. 2327, as passed by the Senate on May 19, included an amendment offered by Senator Gooding, after consultation with members of the Interstate Commerce Commission, he said, to allow the commission a year instead of six months to readjust the violations of the fourth section that may be in effect at the time of the passage of the amendment, that would not be permitted by the new language. The bill as passed provides as follows:

That paragraph (1) of section 4 of the interstate commerce act, as amended, is amended to read as follows:

"(1) That it shall be unlawful for any common carrier subject to the provisions of this act to charge or receive any greater compensation in the aggregate for the transportation of passengers, or of like kind of property, for a shorter than for a longer distance over the same line or route in the same direction, the shorter being included within the longer distance, or to charge any greater com-

compensation as a through rate than the aggregate of the intermediate rates subject to the provisions of this act, but this shall not be construed as authorizing any common carrier within the terms of this act to charge or receive as great compensation for a shorter as for a longer distance: *Provided*, That upon application to the commission a common carrier may, after public hearing, be authorized by the commission to charge less for longer than for shorter distances for the transportation of passengers or property only in a case where the route via the applicant carrier or carriers is longer than via the route of some rail carrier or rail carriers between the same points; but in exercising the authority conferred upon it in this proviso the commission shall not permit the establishment of any charge to or from the more distant point that is not reasonably compensatory for the service performed; and if a circuitous rail line or route is granted authority to meet the charges of a more direct rail line or rail route to or from competitive points and to maintain higher charges to or from intermediate points on its line, the authority shall not include intermediate points as to which the haul of the petitioning line or route is not longer than that of the direct line or route between competitive points: *Provided further*, That the commission may, with or without hearing, upon its own motion or upon application of carrier or shippers, in cases of emergency, such as drought or disaster, authorize during the continuance of said emergency any common carrier or carriers to charge or receive a greater compensation for a shorter than for a longer distance.

"Where any common carrier has, or common carrier have, in effect any rate, fare, or charge which is less for the longer than for the shorter distance between two points (the shorter being included within the longer distance), and which has been authorized by the commission or as to which application was filed with the commission on or before February 17, 1911, and not yet acted upon by it, such rate, fare, or charge shall not become unlawful (except by order of the commission) until after 12 months following the passage of this amendatory act; nor shall such rate, fare, or charge in effect via circuitous rail carrier or rail carriers become unlawful if it shall have been authorized by order of the commission, after public hearings based on no less a showing than that upon which the commission is herein authorized to grant relief: *Provided*, That nothing in this section contained shall prevent the commission from authorizing or approving departures from the provisions of this section in so far as applicable to import or export rates, including rates applicable to traffic coming from or destined to a possession or dependency of the United States, or to a block system of express rates established by order or with the approval of the commission, or permitted by it to be filed."

Paragraph 2 of section 4 of the interstate commerce act, as amended, is hereby repealed.

Attempted as Rider on Appropriation Bill

The efforts of Senators Pittman and Gooding to pass the Gooding bill as a "rider" to the War Department appropriation bill were defeated on May 17 when the Senate voted, 49 to 25, to sustain a ruling by Senator Cummins, president pro tempore of the Senate, sustaining a point of order against the amendment as proposed general legislation on an appropriation bill. Senator Cummins said he was in favor of the amendment, but that as presiding officer it was his duty to apply the rules of the Senate and that he had no doubt whatsoever that the amendment proposed general legislation. The senators in favor of the amendment kept insisting that there were enough votes in the Senate to pass the Gooding bill on its merits but were afraid that it might not pass the House in time to prevent the Interstate Commerce Commission from granting the fourth section relief asked by the western transcontinental lines on 43 commodities to the Pacific coast terminals. They were warned by other senators that they were taking the worst way to accomplish their object because the rules of the House would not permit the House conferees to accept a Senate amendment proposing legislation on an appropriation bill.

Senator Walsh of Montana then attempted to get at the matter in another way by proposing an amendment that no part of the sum included in the bill for river and harbor appropriations should be available until the Gooding bill should have been considered and finally disposed of by the Senate, and, if passed by the Senate, should have been considered and finally disposed of by the House. This, however, aroused the suspicions of some of the advocates of river improvements that it was an effort on the part of those who are more interested in appropriations for the reclamation of

arid lands than in waterway improvements to choke off the latter. Although a point of order against the amendment was overruled by the chair, the amendment itself was defeated without a record vote.

Senator Pittman then tried again with an amendment providing that a \$1,000,000 appropriation carried in the bill for the completion of the construction of a power plant to operate the gates of the Miraflores lock in the Panama canal should not be available or used for such purposes "after the date that the Interstate Commerce Commission shall hereafter grant relief from the provisions of section 4 of the interstate commerce act," upon domestic traffic which now is or hereafter may be competed for by intercoastal water carriers operating through the Panama canal. This was also defeated without a record vote.

Discussion of the Gooding Bill

Senator Gooding then had his bill made the unfinished business of the Senate but allowed it to go over until Monday. The amendment had been the subject of debate in the Senate throughout the week preceding the final vote but Senator Pittman did not actually offer it, for fear of the point of order, until Friday, when Senator Wadsworth, in charge of the appropriation bill, announced that he would not raise the point of order until Saturday. Senators Pittman, Gooding and others made speeches in favor of the amendment. Senator Brookhart made a general attack on the railroads, including his charges of watered stock, grafting, mismanagement, etc., and Senator Norris made a speech on railroad activities to urge people to send communications to Congress regarding proposed railroad legislation. On May 15 Senators Bruce and Fess replied to some of the statements made. Senator Cummins supported the amendment but corrected some of the statements of fact. The Interstate Commerce Commission's interpretation of the latest amendment of the fourth section was severely criticized and Senator Gooding said that "a majority of them are just tools for the railroad corporations." Senators Pittman and Gooding spoke as if it were a foregone conclusion that the Interstate Commerce Commission would always grant the applications of the transcontinental roads, although the present applications have been pending for some time and Senator Bruce pointed out that there are now practically no fourth section violations on rates to the Pacific coast and that the advocates of the amendment were "crying before they were hurt."

Much of the criticism of the commission in the Senate apparently arises from the fact that when the present form of the fourth section was written into the Transportation Act in 1920 and the commission was allowed discretion to authorize some rates in special cases less for longer than for shorter hauls, providing the lower rate is "reasonably compensatory for the service performed," the language was not the same as that used by Senator Cummins in explaining it to the Senate. He then "assumed" that a "compensatory rate means a rate which will enable the railway to defray the cost of maintenance and operation and that will bear its just share of the return upon capital" and that it was therefore materially different from an "out of pocket cost rate." He failed to write this interpretation into the law, however, and the Interstate Commerce Commission in interpreting the language that was used has held that a "reasonably compensatory rate" must "cover and more than cover" the extra or additional expenses incurred in handling the traffic to which it applies. Senator Pittman took the position that this requires only one cent above an out of pocket cost rate. When Chairman Hall was testifying before the Senator committee on the Gooding bill he suggested that if Congress meant what some of the senators seemed to think the law meant it might be well for it to say so.

In the final discussion Senator Fletcher pointed out that if the bill passes the railroads may not reduce rates to the

intermediate points but may advance them to the more distant points. Senator Pittman said the bill is an effort to equalize the rates. Senator McLean said the bill is nothing more than a reflection upon the integrity of the members of the Interstate Commerce Commission.

Section 15a

Representative Shallenberger made a speech in the House on May 14 on his motion to discharge the committee from consideration of the Huddleston bill, saying that the passage of the bill would result in an immediate reduction of at least \$1,000,000 in freight charges. Representatives Lea and Hoch replied. At that time only 27 members of the House had signed the motion, but a few more were added later. The committee at a meeting that morning had decided to begin hearings on May 21 but it is also apparent that bills to repeal section 15a have not the organization behind them that has been manifested in connection with the consideration of the Barkley bill.

The Senate on May 15 passed the bill introduced by Senator Shortridge providing for the ascertainment of the amount owned by the government to the Southern Pacific for expenses incurred in controlling the break in the Colorado river in 1907.

The House on May 16 passed the bill creating a government inland waterways corporation, with a capitalization of \$5,000,000 to carry on the operation of the government-owned inland, canal and coastwise waterway system to a point where it can be transferred to private operation to the best advantage of the government.

The Senate has passed the bill authorizing the secretary of war to sell the Hoboken Manufacturers' Railroad to the Port of New York Authority and the House committee on military affairs has made a favorable report on the bill.

Representative Berger has introduced a bill, H. R. 9244, to condemn and acquire for government ownership and operation railroad, telephone, telegraph and express properties engaged interstate commerce.

A reciprocal demurrage bill, H. R. 9173, has been introduced by Representative Sproul of Kansas, providing for penalties to be imposed on railroads for failure to furnish cars to shippers within a certain time and failure to carry freight at a rate of 50 miles a day.

Representative Milligan of Missouri has introduced a bill, H. R. 9182, similar to one introduced in the Senate by Senator Howell, to take from the Interstate Commerce Commission power to prescribe a minimum rate.

President Coolidge was urged on May 14 by Senator Cummins to recommend to the Bureau of the Budget an additional appropriation of \$800,000 for the valuation work of the Interstate Commerce Commission, which has been considerably curtailed by reduced appropriations. The senator pointed out that the completion of the valuation work is important to enable the commission to administer section 15a of the interstate commerce act and the recapture of excess earnings.

THE WOMEN'S AID of the Eastern Region of the Pennsylvania Railroad held its annual meeting at Philadelphia on May 9, with an attendance of about 3,000. Mrs. C. S. Krick presided. The treasurers' reports showed total receipts during the year of \$112,911; expenditures for relief of employees' families \$67,297; balance on hand at the end of the year \$45,614. This is a combined report of the several district treasuries. The membership of the Aid in the Eastern Region is 92,484, an increase of 35,007 over one year ago. Members of the Aid have done a great amount of social welfare work and in workrooms have made hundreds of garments.

The meeting was addressed by General W. W. Atterbury, who congratulated the women on their effective work.

Hearing on Section 15-a

WASHINGTON, D. C.

THE HOUSE COMMITTEE on interstate and foreign commerce on May 21 began hearings on various bills which have been referred to it to repeal section 15-a, with Commissioner Esch of the Interstate Commerce Commission as the first witness. After Mr. Esch had read a statement prepared by the commission giving a comprehensive review of its administration of the section, Chairman Winslow said there appeared to be a scarcity of witnesses who desired to be heard in favor of its repeal and suggested that Representatives Shallenberger and Huddleston, who have been most active in urging a change in the law, appear as witnesses. Representative Hawes then announced that he proposed to ask all witnesses favoring a repeal whether they were sincerely interested in changing the act or trying to bring about government ownership of the railroads. He said he had a right to ask whether the "guerilla warfare attack" on the transportation act was not an effort to smash the railroads. Representative Shallenberger objected to the term "guerilla" but did not disclose his position on government ownership. Representative Huddleston said it was none of Hawes' business what his private views were on the subject and suggested that if it were to be inquired into the committee had better investigate as to how many of Hawes' constituents are interested financially in railroads. Chairman Winslow said that although he had sent notices to all who had indicated interest in the matter the only witness who had notified him of a desire to appear in favor of a repeal was John E. Benton, general solicitor of the National Association of Railway & Utilities Commissioners. Representative Rayburn stated that R. C. Fulbright desired to appear in favor of amendment of the section on behalf of the National Industrial Traffic League.

The report read by Commissioner Esch outlined the conditions existing when the railroads were returned from federal control, which the act was designed to meet, its various decisions as to rates, the statistics as to railroad earnings and expenses and rate of return, and the steps taken by the commission to inform itself, particularly through the study of reports, as to whether the railroads have been and are being honestly, efficiently and economically managed. In discussing the recapture clause he said that some carriers are contending that the commission must fix the values of the properties before payment of the excess can be required but that its Bureau of Finance has been trying to work out a practical method of preliminary settlement without awaiting a final determination of the value, and he furnished a list showing what payments had been made. The returns for 1923 are not yet complete as some roads were given an extension of time beyond May 1. Mr. Esch said that in a general way the commission had a check on the carriers' expenditures and that it was confident that serious mismanagement would be promptly reflected in the statistical reports, as the work of the bureaus of statistics and of accounts from day to day reflect conditions which bear on honesty, efficiency and economy of management.

Commissioner Eastman filed a separate report dissenting from some of the statements, particularly relating to the supervision of expenditures. He said the commission, broadly speaking, had no organization properly equipped for investigation of such matters and that it would not be possible to build up such an organization without a large increase in appropriations. If it is reasonable to expect a government board without control over management and with no special appropriation for the purpose, to remedy deficiencies in private management, he said, better results in his opinion could be secured by direct government management. Commissioner McManamy also dissented, saying that in his opinion the commission is fixing the income of the

carriers without giving sufficient consideration to their expenditures. He believed that the commission is not fully complying with the requirements of section 15-a in this respect and that it cannot do so in the absence of an adequate appropriation for that purpose and an organization whose duty it would be to keep informed of such matters. Commissioner Campbell concurred in Commissioner McManamy's statement.

Transportation Act Severely Tested*

By Samuel O. Dunn

Editor, *Railway Age*

FROM THE ATTACKS that have been made upon the rate-making and the labor provisions of the Transportation Act, it might be inferred that they have resulted in great injury to railway employees through awards made by the Labor Board, and that they have resulted in great injury to the public by encouraging inefficient and extravagant management of the railways and permitting the charging of excessive rates to pile up huge profits. Let us see what are the actual facts regarding what has occurred in the railroad field since the Transportation Act went into effect.

The railways have not earned large profits, although it has been constantly charged that their profits are "guaranteed." The Interstate Commerce Commission held that they were entitled to earn a return of 6 per cent on their tentative valuation until March 1, 1922, and $5\frac{3}{4}$ per cent thereafter. Up to this time either of these returns would have been less than the net operating income actually earned by the railways in 1916, eight years ago. But what they actually earned in 1921 was $3\frac{1}{3}$ per cent, in 1922, 4 per cent, and in 1923, 5 per cent. The total net operating income they have earned in the three years and six months since the real "guarantees" of the government were withdrawn is \$1,200,000,000 less than the Interstate Commerce Commission has held it would be fair and in the public interest for them to earn.

How have railway employees been affected by the operation of the Transportation Act? In 1919, the last year of government operation, and the last before the Transportation Act was passed, their average wage (not including the salaries of officers) was \$1,461. In 1920 it was \$1,794. In 1921, owing to the great slump in business, wages were reduced, but still averaged \$1,652. In 1922 they averaged \$1,590, and in 1923, \$1,588. *In other words, in every year since the Transportation Act was passed the average wage of railway employees has been higher than it ever was in any year before it was passed.*

Furthermore, their hours of work have been so reduced that, excepting in 1920, they have worked fewer hours annually since the Transportation Act was passed to earn their wages than they ever worked in any year before. In 1923 the average hours worked per each employee was 2,584, which was 85 hours less than in 1919, and 564 hours less than in 1916. The reduction in hours of work since 1916 has been equivalent, on the basis of a ten hour day, to a reduction of $56\frac{1}{2}$ working days annually, and on the basis of an eight hour day to a reduction of more than 70 working days.

The facts that under the Transportation Act the wages of railway employees have been increased and their working hours reduced seem conclusive evidence that it has not injured them.

Has the efficiency and economy of railway management and operation increased or declined? As I have already

shown, in the last month of government operation, February, 1920, the operating expenses of the railways averaged \$14,310,450 a day. Immediately after they were returned to private operation the employees were granted a large advance in wages. Owing to this and to increases in the prices of fuel and materials, the operating expenses increased to about \$17,000,000 a day in September, 1920; but since then they have been enormously reduced. In March, 1924, the last month for which statistics are available, the railways handled more traffic and paid a higher average wage to employees than under government control, and yet in that month their operating expenses were but \$12,589,500 a day. This was about four and a half million dollars a day less than in September, 1920, and \$1,723,000 a day less than in the last month of government operation.

I call your attention especially to the fact that none of this reduction of operating expenses, as compared with the expenses being incurred toward the close of government control, is due to reduction wages, since the average wage being paid to each employee actually is greater than it was then. The increase in efficiency of management that has been effected is best illustrated by the principal cause of this great reduction of expenses, viz., that the railways, while handling a larger business, now have 220,000 less employees than they had when government operation was terminated.

Is the public benefiting by this increase of efficiency and economy in management? First, freight rates have been reduced so much since they reached their peak in 1921 that the public is paying the railways in freight charges and passenger rates at the rate of \$683,000,000 less annually than it would be paying them if the rates of 1921 were still in force. Secondly, the public is benefiting through a great improvement in transportation service.

As a result of the economies that have been effected the railways have been able not only to stand the large reductions of rates that have been made, but to increase the net operating income earned by them from $3\frac{1}{3}$ per cent in 1921 to more than 5 per cent in 1923. This increase in net operating income made it possible for them last year to raise and invest more than one billion dollars in improving and increasing their facilities. The result of this improvement and increase of their facilities has been that for more than a year, while handling the largest freight business in history, they have been able to render to shippers an eminently satisfactory service.

Summary

To summarize the facts show that under the Transportation Act—

1—The huge deficit incurred as a result of government control has been wiped out.

2—The employees have received the highest wages they ever were paid and also reductions of their hours of work.

3—There has been a great increase in the efficiency and economy with which the railways have been operated.

4—There has been made very large reductions of rates.

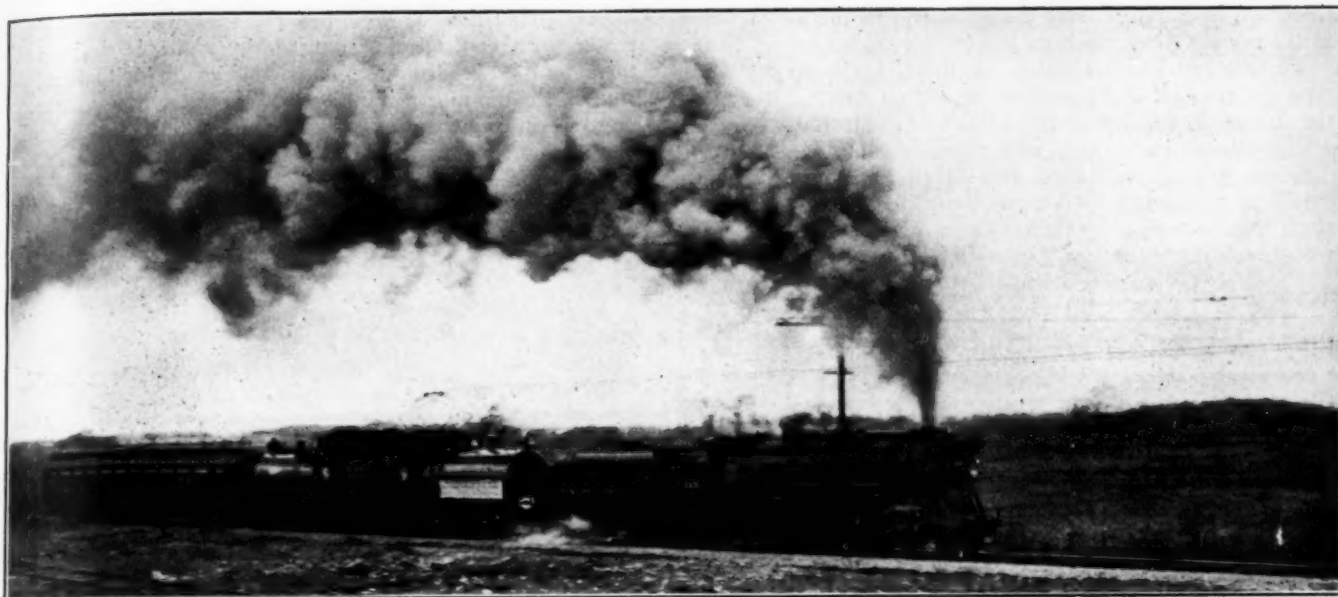
5—The net operating income of the railways has been increased.

6—The railways have been able to begin carrying out an extensive program of improvements and expansion, and

7—There has been a great improvement in the service rendered shippers.

This record of actual achievement under the Transportation Act is a remarkable one. It is reasonable to assume that if it should be left in effect the railways would be able to continue to make increases in the efficiency and economy of operation and to effect improvements in their properties which would enable them both to continue to give good service and within a reasonable time to make further reductions of rates. And yet since the present Congress convened there have been introduced almost 200 bills to repeal the Transportation Act, or emasculate its essential parts.

*From an address on "Constructive or Destructive Railway Regulation," before the National Association of Manufacturers at the Waldorf-Astoria Hotel, New York, May 19, 1924.



Steam Locomotive Hauling Electric as a Demonstration of Regenerative Braking

Electric Traction Exhibit Held at Erie, Pa.

Demonstration Includes a 3,000-Volt Direct Current Multiple Unit Train for Suburban Service

ELECTRIC LOCOMOTIVES, a steam locomotive, a 3,000-volt multiple unit train, a laced type overhead trolley, a hornless pantograph and the otheograph were included in exhibits and tests held by the General Electric Company at Erie, Pa., on May 19.

The electric locomotives shown included two of those just completed for the Mexican Railway Co. Ltd., described in the

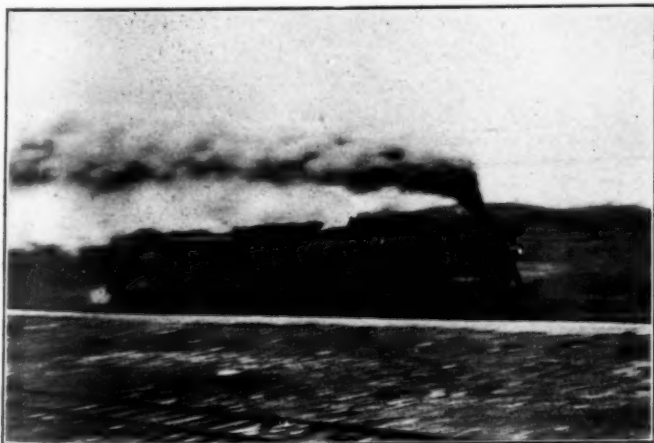
tady, Troy and Albany; it will be on exhibit during the American Railway Association Convention at Atlantic City, N. J., June 11 to 18.

The Multiple Unit Train

The multiple unit train consists of a motor car and a trailer coupled in the usual fashion with automatic couplers. The car which has been used for the installation of the electrical equipment was purchased from the Michigan Railway Company and had previously been in operation for about two years on 2400-volt direct current between Kalamazoo and Grand Rapids, Michigan. The 2400 volts was later changed to 1200 volts because of third rail difficulties. The body is 66 ft. 10 in. in length over the vestibules and contains parlor, baggage and smoking compartments, as well as main passenger section. The equipment installed includes four GE-280-1500/3000 volt railway motors, type PC control, an electric hot air heating system, low-voltage multiple lighting and a complete equipment of combined straight and automatic air brakes.

The motors are geared in the usual manner to the four axles of the car and arranged for operation in full series or series-parallel. Each motor has an hourly rating of 200 hp. and weighs complete with gear, pinion and gear case approximately 6,875 lb. The motor is practically the same mechanically as the 1500-volt motors recently built for the Paris-Orleans Railway, except that insulation has been added to take care of the higher trolley voltage. Minor changes were also necessary in windings and commutator. The motor is of the standard ventilated design. The gear reduction is 70/21 giving a ratio of 3.33 and a maximum emergency operating speed with 36 in. wheels of 60 miles an hour.

The motor capacity is sufficient to handle without overheating a 40-ton trailing coach, and at a somewhat reduced schedule, two trailing coaches. For demonstration purposes, the trailer has been equipped with control couplers and cables and a master controller at one end. The train can,

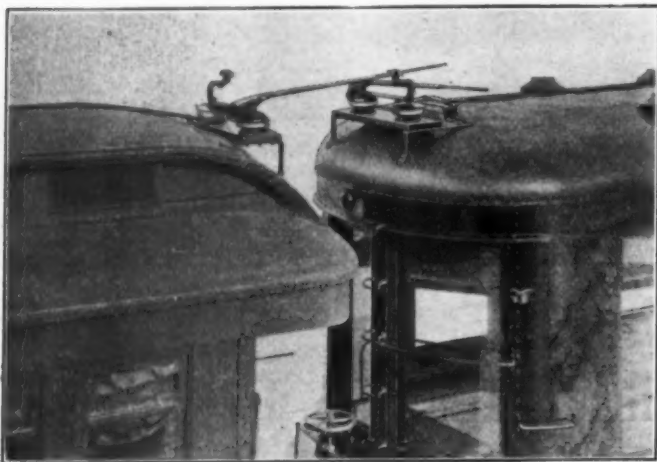


New York Central Mikado Running at 63 Miles an Hour Just Before Passing Over the Otheograph

December 1, 1923, issue of the *Railway Age*, page 1021, and a Chicago, Milwaukee & St. Paul gearless passenger locomotive. The C. M. & St. P. locomotive which was placed in service on the Cascade division early in 1920 was described in the March 26, 1920 issue of the *Railway Age*, page 1051. It is now being taken through the East by the passenger department of the railroad. From Erie the locomotive and the coach which accompanies it will be taken to the following cities in New York state: Buffalo, Syracuse, Utica, Schenec-

therefore, be handled from the front end of the motor car or in the reverse direction from the control trailer.

The control is designated as PC-104 electro-pneumatic type and consists of a cam operated switch group. In general the design is similar to the 1500-volt control used for the Paris-Orleans motor cars with provision for higher voltage. The low voltage for control and lighting is obtained from a small 65-volt generator having the armature carried on the shaft extension of a 1500/3000 volt dynamotor. The dynamotor winding is used to operate the CP-30 air compressor at 1500 volts. A 28-cell storage battery is floated across the



Device Used to Connect 3000-Volt Heater Circuit on Trailer to Power Circuit on Motor Car

65-volt generator which operates the lights and control apparatus when the set is shut down.

A feature of the control is a line breaker consisting of high speed contactors connected in series for interrupting the 3000-volt circuit. When the master controller is thrown to the off position, the motor current is broken by the line

The connection between the 3000-volt heater bus on the motor car and the trailer is made by a simple device called the type SZ-14-A coupler. A swinging arm with insulating support resembling a miniature trolley and base is mounted on each car and the connection is made by placing the arm of one car under a hook on the other. The coupler is manipulated from the ground by a switch hook. Current is collected from the overhead trolley by a single type S-501 slider pantograph.

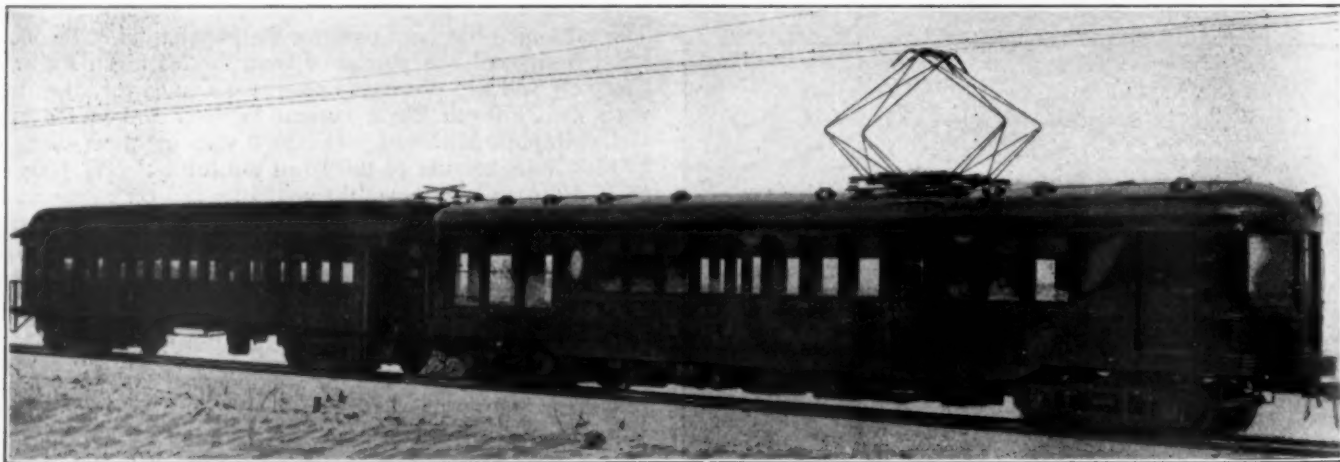
Current Collection Tests

In the early part of 1923, the General Electric Company was asked to supply certain definite information regarding the limits of current collection from an overhead trolley wire at different voltages. This information was requested in connection with the proposed 1500-volt electrification of the Cleveland Union Terminals, where it is anticipated that unusually severe conditions will exist. It was found that very little authentic information was available, and it was therefore decided to make a complete investigation of the problem.

The present laced type construction used on the four-mile experimental track was finally selected as the most satisfactory design for collecting heavy current at any speed and for conducting current to the contact wire.

The test train used to demonstrate current collection consists of a 110-ton gearless locomotive arranged for operation on either 750 or 1500 volts followed by a gondola in which are installed sufficient iron grid rheostats to consume the current required for the test. Sections of the rheostats can be inserted or removed by remote controlled contactors to give whatever current may be called for.

Another problem which arose in this connection was the detail of construction upon approaching and leaving a low overhead bridge. Tests are therefore now being made to determine the most satisfactory slope of the contact wires upon approaching and leaving points of minimum clearance. The temporary equipment used for these tests includes a skeleton bridge from which conductors are supported by means of adjustable supports, so that tests could be made using a slope of the contact wire, varying from $\frac{1}{2}$ to $1\frac{1}{2}$ per cent. The



The New 3000-Volt Direct Current Multiple Unit Train

breaker, which reduces the duty on the other equipment. The control is arranged for seven steps full series and six steps series-parallel, including the tapped field connection on the last step.

The heater equipment consists of a 30 kw. and a 10 kw. grid taking current from the 3000-volt bus line with suitable control. These heating elements are enclosed in an insulated box underneath the car. The hot air is carried to various parts of the car through a duct by a motor driven blower. Similar equipment is also installed for heating the trailer coach.

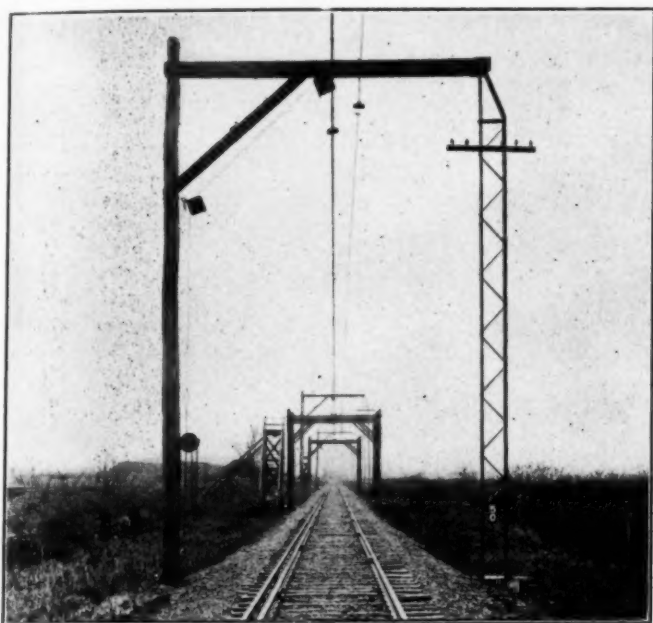
height of the contact wire varies from 18 ft. 6 in. to 22 ft. above the rail. A device is also used to indicate accurately the amount of vertical movement of the contact wires upon the passing of each pantograph. Accurate information is thus being secured to solve the engineering problem of collecting heavy currents from a moving pantograph at various speeds and under all conditions.

The Otheograph

The otheograph is a device designed to record the action on the rails of each separate wheel of a locomotive or motor car.

It shows by a graphic record the amplitude and characteristic of both the vertical and transverse thrust of the wheels on each tie. The vertical deflection is transmitted through heavy springs underneath the rail and the transverse deflection through similar springs set vertically and bearing against the head of the rail. The deflection of these springs on the passage of a locomotive is recorded through a lever arm with a pointer at the end which traces a record on paper wrapped around a rotating cylinder similar to an engine indicator.

The otheograph ties may be installed in place of the regular ties on the track, either singly or in a grouping of several, and on curves or tangent tracks. The installation on the Erie test tracks comprises 25 of these ties grouped together covering a distance of fifty feet in tangent track. The revolving mechanism provides for moving all of the recording cylinders on each side of the track simultaneously allowing as



Chain Block and Gallows Used to Adjust Grade of Trolley Ahead of the Structure Shown at the Rear, Which Represents Overhead Bridge

many records to be taken of each side of the locomotive as the number of the ties that are grouped together. The movement of the operating mechanism for the recording cylinders is independent of the speed of the locomotive. The operating mechanism is driven by a constant speed motor with suitable gear reduction in order that the distances between the peaks on the curves are proportional to the actual distance between the wheels on the various locomotives.

Each record taken shows all the wheels of the locomotive and is so made that the pressure and lateral movement of the leading wheel is shown at the left end. Each recording head indicates the vertical and lateral deflection of the rail as the successive wheels pass over the tie. The record is not necessarily limited to one locomotive only, as, by moving the paper slowly, the record of all the wheels of an entire train might be taken.

Particular attention has been given in the installation of the otheograph test tracks at Erie in an effort to obtain the same type of roadbed as the rest of the track. Each of the otheograph ties is located immediately over a wooden tie with the same supporting ballast as elsewhere. Between the otheograph tie and the wooden tie is a thin wooden stringer to retain the alignment but with no appreciable vertical stiffness. The action of a locomotive running over these two would seem to indicate that no unusual track condition is imposed.

In cases when wheels are close together, it is probable that

the wheel which has just passed an indicating point on the otheograph is still having some effect on that point as the following wheel passes the point, due to stiffness of the rail. The otheograph does, however, give an accurate record of the effect of a locomotive on the track. At present the results obtained are relative only, but a method has been devised for the purpose of applying a scale to the otheograph record so that it will measure the forces on the rail in pounds.

Locomotive Tests

Speed tests of the New York Central Mikado and the Chicago, Milwaukee & St. Paul electric locomotives were made by running the locomotives at various speeds along the test track over the otheograph. The Mikado was run at speeds up to 63 miles an hour and the electric at speeds up to 65 miles an hour.

The regeneration test consisted of pushing the electric with the steam locomotive and allowing the electric to return power to the trolley. This effectively demonstrates regenerative braking as it is evident that the steam locomotive is working under conditions of heavy load and in spite of the tractive effort applied to the rail by the steam locomotive the speed is held constant by the electric.

Work of Thieves Retarded Since 1921

A TOTAL OF 100,553 ARRESTS were reported by 87 Class I railroads to the Protective Section of the American Railway Association during 1923, as a result of which 87,502 persons or 87.3 per cent were convicted. For the first six months of 1923 the claim payments due to robbery totaled \$1,620,800 or 7.1 per cent of the total claim payments, compared with \$2,976,791 or 10.9 per cent of the total freight claim payments in the same period of 1922. This is a decrease of 43.4 per cent during a period when the number of cars loaded with revenue freight increased 18.6 per cent.

Since the formation of the Protective Section of the A. R. A. in 1921 robberies have shown a marked decline. In 1921 all classes of robberies caused payments of \$9,924,747 or 10.3 per cent of the grand total of freight claim payments of which the payments on clothing, tobacco, shoes, automobiles and fruits and vegetables totaled \$6,820,182 or 68.7 per cent. Robbery charges in 1922 aggregated \$4,806,720 or 10 per cent of the total claim payments, which is a decrease of 51.1 per cent from 1921.

For the month of January, 1924, 104 Class I carriers, with a mileage of 213,020 in the United States and Canada, reported 7,695 arrests for felonies and misdemeanors. The number of arrests for each carrier ranged from none to 1,076. Employees arrested totaled 324, the largest number for any one road being 32. The number of convictions reported during the month was 6,781, and the number of acquittals was 275.

Prior to 1921, there was no available channel through which the heads of the railway police departments could co-operate with each other or exchange information of common interest. An association called the American Railway Chief Special Agents and Chiefs of Police Association existed but it had not been recognized or assisted to any great extent by the railroads as a whole. In January, 1921, there was formed as a part of the American Railway Association a section designated as the Protective Section. This section was created at the request of the heads of railroad police departments as they felt the necessity of having some central point of contact through which they could develop a closer relationship among the several railroad police departments.

The section held its first meeting in July, 1921, and took

over the activities of the American Railway Chief Special Agents and Chiefs of Police Association. It created 12 sectional police committees, located at New York, Chicago, Dallas, Tex.; Kansas City, Mo.; Richmond, Va.; Memphis, Tenn.; Seattle, Wash.; Denver, Col.; Atlanta, Ga.; St. Paul, Minn.; San Francisco, Cal., and Salt Lake City, Utah. These sectional committees have been organized for the purpose of permitting the men of the different areas to get together twice a year for the exchange of ideas, and a general discussion of ways and means of improving the police service of the railroads, and to obtain closer relationship between the railroad police in these several communities. It is the practice for these sectional committee meetings to be addressed by municipal officers such as judges of the municipal or criminal courts, local prosecuting attorneys, local operating officers, or a local freight claim officer.

The following table shows the improvement in claim payments resulting from thefts and robberies reported by 216 carriers since 1920:

Year	Robbery entire package	Per cent Increase or Decrease over previous year	Per cent of all claims	Robbery other than entire package	Per cent Increase or Decrease over previous year	Per cent of all claims
*1920	\$4,324,691	.....	3.5	\$8,402,256	.....	6.8
1921	4,404,770	+1.8	4.6	5,519,977	-34.3	5.7
1922	2,324,881	-47.2	4.8	2,481,839	-55.0	5.2
1923	1,473,279	-36.6	3.0	1,644,205	-33.8	3.3

*Estimated from reports of 185 carriers.

Robbery of entire package and other than entire package in 1921 decreased 22.0 per cent; in 1922, 51.5 per cent and in 1923, 35.1 per cent. These decreases were effected, notwithstanding the decrease in claim payments of all classifications which in 1921 was 11.2 per cent; in 1922, 50.2 per cent and in 1923 an increase of 3 per cent. The ratio between the losses on account of robbery and the total freight claim payments decreased from 10.3 per cent in 1920 to 6.3 per cent in 1923. This reduction is due to a number of reasons.

The organization of the Protective Section of the American Railway Association has been the means of bringing about closer co-operation between agents, and has led to the discussion of mutual problems and the exchange of statistics, enabling each railroad to know what other roads are accomplishing. The railroad managements have recognized the importance of the railway police departments and have made appropriations for their maintenance which have resulted in the selection of a higher grade of men. The Protective Section has supplied monthly statements to operating and police department officers, showing the number of arrests made, and the convictions obtained by the various Class I railroads so that all concerned are informed how one road compares with another in this respect. This has created rivalry and additional interest among employees.

Quarterly theft ratio statements are also issued by individual railroads which show the relation between the charges to robbery of each railroad and the total freight claim payments. A number of railroads have issued monthly statements to their police department employees to create interest, which statements show the losses on account of robbery, the arrests made and the convictions obtained by divisions.

Special investigators or police department employees have been placed at large freight stations to see that no unauthorized persons are permitted to enter the freight house or go upon the freight platforms where freight is being loaded onto or from trucks. These men also check car seals, defective door fastenings, etc. Where large shipments of valuable commodities are made in carload quantities, train riders accompany the cars, particularly over territory where there is the greatest opportunity for pilferage. This method of protecting such shipments as cigarettes, silks and alcoholic liquors, has resulted in a very large saving in losses on shipments of this kind.

Freight Car Loading

WASHINGTON, D. C.

FREIGHT CAR LOADING declined slightly during the week ended May 10 as compared with the week before. The total was 909,187 cars, a decrease of 65,554 cars as compared with the corresponding week of last year and an increase of 142,093 cars as compared with 1922. As compared with last year increases were shown in the loading of grain and grain products, live stock and miscellaneous, but decreases were shown in the loading of other classes of commodities, and the Southwestern district was the only one to show an increase over last year. The summary as compiled by the Car Service Division of the American Railway Association follows:

REVENUE FREIGHT CAR LOADING

Week Ended May 10, 1924

Districts—	1924	1923	1922
Eastern	222,270	239,374	185,218
Allegheny	192,471	213,812	146,055
Pocahontas	37,766	39,812	40,676
Southern	129,350	137,932	126,005
Northwestern	133,444	151,425	108,213
Central Western	133,114	135,215	110,396
Southwestern	60,772	57,171	50,531
Total Western	327,330	343,811	269,140
Commodities—			
Grain and grain products	41,485	31,979	41,937
Live stock	32,354	29,045	29,697
Coal	136,046	175,088	78,789
Coke	9,010	15,315	8,765
Forest products	73,483	74,428	60,324
Ore	45,223	59,616	14,097
Mdsc., l.c.l.	249,423	243,614	240,669
Miscellaneous	322,163	345,656	292,816
Total	909,187	974,741	767,094
May 3	914,040	961,617	747,200
April 26	878,892	962,578	751,111
April 19	876,923	958,042	706,137
April 12	881,299	947,271	700,155
Cumulative total, January 1 to date.	16,909,711	17,017,094	14,278,847

Canadian Car Loadings

Revenue car loadings at stations in Canada during the week ended May 10 amounted to 55,149, an increase of only 163 over the previous week. In the Eastern division grain, live stock, lumber, pulp and paper and miscellaneous showed increases of 565 cars, 154,250 and 412 cars, respectively, but coal showed a seasonal decrease of 1,246 cars. In the Western division loading maintained the previous level. Compared with the corresponding week in 1923 the increase was 1,705 cars, and the cumulative total shows an increase of 80,696 cars, or 8.8 per cent.

Car loadings, by commodities, for the three weeks, are as follows:

Commodity—	For the week ended		
	April 26, 1924 Cars	May 3, 1924 Cars	May 10, 1924 Cars
Grain and grain products	7,325	8,013	8,699
Live stock	2,316	2,181	2,285
Coal	5,472	5,113	3,890
Coke	243	267	321
Lumber	3,481	3,903	3,857
Pulp wood	2,125	1,825	1,835
Pulp and paper	1,819	1,824	2,065
Other forest products	2,795	2,330	2,218
Ore	1,130	1,432	1,172
Merchandise, l.c.l.	15,531	15,524	15,778
Miscellaneous	11,166	12,574	13,029
Total cars loaded	53,403	54,986	55,149
Total cars received from connections	32,280	32,473	32,750
Total cars loaded for corresponding week, 1923	52,195	51,582	53,444
Cumulative loading to date, 1924			1,000,530
Cumulative loading to date, 1923			919,834

The freight car surplus showed a slight decrease during the first week in May to 324,779 cars, including 180,888 coal cars and 106,267 box cars.

The Canadian railroads during the first week of May had a surplus of 18,475 cars, including 14,900 box cars and 400 coal cars.

THE ROAD BED that was formerly used by the Cripple Creek Short Line between Colorado Springs, Colo., and Cripple Creek has been converted into an automobile road.

The Problem of Mechanical Statistics

Present Data Inadequate—Car Service Division Locomotive Condition Statistics Criticized

By J. E. Slater

Special Assistant to the General Manager, New York, New Haven & Hartford

PART I—EQUIPMENT CONDITION AND OUTPUT

IN ISSUES of the *Railway Age* for the past few months there has been carried on considerable discussion on two important railroad subjects. The first of these is the tendency of mechanical expenses to increase in a greater degree than other operating expenses. The second is the proposed change in the classification of operating expenses. So far as the writer knows, these two subjects have not been discussed together, though such a discussion would be of value in working out a solution of both.

One of the first facts that comes to the attention of the analyst of mechanical expenses is the lack of adequate mechanical statistics. In no department of railroad service are there less data on which a definite judgment can be made as to efficiency of performance or economy in expense. Those who believe that mechanical expenses are out of line base their claim primarily upon the trend of maintenance of equipment ratios as compared with maintenance of way and transportation ratios. Those who justify the trend of mechanical expenses base their claims primarily upon the increase in the size of locomotives and cars and the large number of appliances on locomotives which help to reduce transportation expense, but increase maintenance. Such arguments must be general in character since neither side has much basic evidence to prove its case. There is little information to measure the effect of the respective factors. There is no basis of judgment. Certainly we should have this if we are to arrive at a sound conclusion. Even in the field of equipment condition, some of the basic information is faulty. It is of the greatest importance, therefore, that if and when changes are to be made in the classification of accounts, care should be taken to provide more and better basic material for the use of the mechanical and executive officers.

In discussing statistics of any kind it is necessary to distinguish between those required by the Interstate Commerce Commission and those used by the railroads themselves. The Interstate Commerce Commission should and has been conservative in its requests for operating statistics, and most railroads have for their own purposes more information than that required. It has been the writer's observation, however, that on most railroads the mechanical statistics are few, especially when compared with those in other departments. Such comment as will be made will be directed to the sum total of all mechanical statistics compiled, both required and not required, which are in use on many of the important railway systems.

In checking the efficiency of a mechanical department there are three phases of the operation to be considered:

1. Condition of equipment.
2. Output of shops and engine houses.
3. Cost of work performed.

Statistics Showing Condition of Equipment

Statistics as to condition of equipment may be divided into two classes, general and specific. The specific statistics are those showing condition of each engine, showing separately data as to condition of boiler, flues, firebox, machinery, tires, etc. These data are vitally necessary, and

if the inspection upon which the report is made is careful and intelligent, the report will be valuable. Frequently, however, this report, on account of its detailed character, does not go beyond the mechanical department offices. Superior officers as well as the regulating bodies to which reports are made must depend on more general information. This general information is based either on the number of locomotives out of service at a specific time in each period, or on an average of those out of service at a particular hour each day of the period. Most railroads have a report of some kind which shows the number of engines out of service at a particular hour each day. Sometimes the report includes only the engines out of service 24 hours, while in other cases it includes also engines which are out of service less than 24 hours. These reports have been the basis of the statistics sent to the Interstate Commerce Commission for the O. S. forms and to the Car Service Division of the American Railway Association. In both of these reports (up to the recent change in the basis of the Car Service Division report), the basis has been the engines out of service for repairs requiring 24 hours.

This report has some weaknesses. The report is frequently not a description of a condition, but an estimate. It does not tell the number of engines which have required 24 hours of repairs, but the number which the mechanical department *think* will require 24 hours of repairs. The primary reason for this is the necessity of having current reports which describe the present and not a past condition. No one can blame the enginehouse foreman for being an optimist. Even if he be the reverse, he may be wrong, and the purpose of reports and statistics is to present the facts. Checks which have been made to determine the accuracy of these reports have shown that the actual engines out of service in a given period were 20 per cent different from the estimate report. In another case, the condition of locomotives as indicated by the estimate report was compared with another report showing condition from the standpoint of performance. Here again the estimate report was found to be entirely erroneous in its indications. Such a condition is likely to be found wherever the estimate basis is used. This difficulty in the report is easily remedied. It will be correct if it is based on the work of the last 24 hours (actual work), rather than on the estimated work of the next 24 hours. It can show the number of engines which have been dispatched during the previous 24 hours which have required 24 hours of repairs. This basis is now followed on some railroads.

Running Repairs Defined as

Repairs Requiring Over 24 Man-Hours

In the latest report on condition of locomotives called for by the Car Service Condition, an entirely new basis is instituted. Instead of a 24 clock-hour basis, a 24 man-hour basis is used. The report to the Car Service Division is to include under unserviceable locomotives all engines which will require more than 24 man-hours of repairs. The reason for this is doubtless to standardize the difference in

basis where clock hours are used. If, under the clock-hour basis it is the intent to include only engines requiring repairs of over 24 hours, much would depend on the number of men working on the locomotive at one time. It is quite conceivable that the report would exclude locomotives on which there were actually 60 or more man-hours, while it would include engines on which the amount of work was but little more than 24 man-hours. The size of the engine-house, the nature of the work, the number of men who could with the greatest efficiency work on the locomotive at one time and other factors having little to do with the condition of the engine, would determine the number of engines considered unserviceable.

Yet, in the fixing of 24 man-hours of repairs as the measuring stick of serviceableness, the Car Service Division has adopted a radical change. It will add one other basis to those already existing. It will require one more report on another basis in addition to those required by the Interstate Commerce Commission and the railroads themselves. It will destroy the comparison with previous periods with the resulting benefits. More important, however, is the fact that it will be extremely difficult to obtain the information on an accurate and uniform basis. If the 24 man-hours are to include inspection the result will be different from the case where inspection is not included. If they are to include a proportion of general labor charges to repairs, such will bring about a result different from the case where it is not included. Theoretically, the report should include all engines requiring repairs which will take 24 man hours chargeable to maintenance of locomotives. Yet, there is so large a proportion of repair charges which are common to all engines at any point, that the report would differ in accordance with the extent to which man-hours and expenses actually are charged against individual locomotives. In any event, if the railroads conscientiously make out the report, it will bring about very important changes. In the case of one road, the number of engines classed as unserviceable increased several hundred per cent when the man hour basis was adopted. Other railroads have not changed the basis at all. Regardless of the instructions, therefore, the report covering all railroads in a district now includes engines out of service for 24 clock hours of repairs, engines out of service 24 hours for repairs, and engines out of service for 24 man hours of repairs.

Clock-Hour Basis Preferable

Some standard basis should be adopted which would be used by the railroads, by the Interstate Commerce Commission and by the Car Service Division. Such a basis should eliminate the element of guess work. The writer also believes that it should be based upon a clock-hour rather than a man hour-basis, partly because it will maintain comparability with the old reports, but particularly because the man-hour basis introduces other and new opportunities for differences in method among railroads.

Car Condition

When we turn from condition of locomotives to condition of cars, we find a much less troublesome situation. The standardization of car repair rules and practices has established definitely what constitutes a bad order freight car. This has resulted in all the reports being on substantially the same basis, whether they be Interstate Commerce Commission, Car Service Division or the railroads' own reports. The Car Service Division's report is also valuable in showing the number of light and heavy bad orders. The establishment of 20 man-hours as the dividing line between light and heavy repairs is consistent with general railroad practice. Such is not the case in the use of 24 man-hours for locomotives.

The number of bad order passenger cars is not commonly

reported, but on important passenger roads it is just as important a report as the bad order freight car report. The supply of cars must be closely watched not only for current needs, but especially for periods of peak traffic such as holidays, periods of heavy vacation traffic, days of big athletic contests, etc. As a rule, bad order passenger cars require but light repairs, the heavy work being painting and upholstering and the like, which does not prevent the operation of the cars in emergencies.

Statistics Showing Output of Shops and Enginehouses

The statistics of output of repaired locomotives vary in accordance with the class of work done. The cost of classified repairs to locomotives is usually measured by the number of engines given classified repairs, while the cost of running repairs is measured by engines dispatched or some like unit. The locomotive-mile is often used to check the total cost of repairs, but except over long periods the cost per mile is of little value. This is due to the fact that classified repairs, both in number and character, vary considerably from month to month with no regard to the service performed by serviceable locomotives.

Taking up first the unit of classified repairs turned out, we find an excellent example of the difficulty with our mechanical statistics as at present compiled. The classified repair is not truly a unit. A statistical unit should be standard, definite, unvarying and consistent in its effect on the expense which it is measuring. This theoretical ideal of a statistical unit is, of course, never attained, yet for practical purposes such units are found to check transportation expenses and can be used as a basis of judgment. But the classified repair varies over such a wide range that it is next to impossible to use a cost per classified repair as a basis of judgment as to the efficiency with which the repairs were made. Classified repairs are divided into five classes, but even within these classes the amount of work on different locomotives of the same type differs very widely. For example, on two locomotives of the same class given Class 3 repairs in the same month, the cost for one was approximately \$2,500, and for the other approximately \$8,000, the man hours for the first engine being 1,780 and for the second, 7,780. An analysis of the work done shows that both engines actually did receive a Class 3 repair in accordance with the prescribed form, yet the amount of work done on the low cost engine was small as compared with that on the other.

The more expensive engine had the following important work done in addition to the ordinary classified repair work: new front tube sheet, new back tube sheet, one-half right and one-half left side sheets, throat sheet patched, new set of superheater tubes, new set of small tubes, two new cylinders complete with bushings, new pistons and heads, guides and guide yokes renewed, main rod brasses renewed, new right and left side rod bushings, driving brakes overhauled complete, two main frames, six new tires, all driving boxes brassed and planed, all new driver box bearings, all new shoes and wedges, one new spring, engine trucks overhauled complete with new brasses, cab overhauled, general repairs to tender. On the other engine, there was no fire-box work with the exception of small patches on the throat sheet. There was a new set of small tubes but not of superheater tubes. With the exception of new main rod and side rod bushings, there was no other important new material.

While it is undoubtedly true that the amount of work on the first engine was greater and on the second less than average, these examples can be multiplied many times on almost any railroad. They indicate the wide variations possible under the present classification. As further examples, two engines of the same type being given Class 3 repairs cost \$4,000 and \$6,000, respectively. That the same

thing is true in connection with Class 5 repairs can also be indicated by specific examples. Two engines of the same type cost \$3,000 and \$4,500, respectively. Two others cost \$2,000 and \$4,200, respectively, and two others \$5,400 and \$8,000, respectively. Innumerable examples can be found of Class 5 repairs costing more than Class 3 repairs.

In comparing the cost per classified repair over a long period at two different shops on one road, it was found that at one shop the cost per Class 3 repair for labor was but 19 per cent higher than the average for a Class 5 repair at the same shop, while the costs per Class 3 and Class 5 repair for material were almost the same. In another shop, the cost per Class 3 repair for labor was 48 per cent higher than for a Class 5 repair and the cost per engine for material for Class 3 repairs was 87 per cent higher. The reason is obvious. The character of work both for Class 3 and Class 5 repairs at the two shops was entirely dissimilar. That fact, however, leaves us where we started as to the efficiency of the shops. It will be generally conceded that the number of classified repairs as a measuring stick of efficiency is of almost no value. Yet, it is all that we have at the present time in general use and we are compelled to use it as best we can.

Sub-division of Present Repair Classes Suggested

If the only practical measure of locomotive shop output is the number of classified repairs, an improvement could be effected by subdividing the present five classes. If it is not possible to obtain units which are unvarying, it should be possible to reduce the spread in the cost for the same type of engine for the same class of repair. At the present time, an engine given a new set of flues is called a Class 3 repair, regardless of the extent of the work on the firebox. A new firebox will make the engine a Class 2 repair, but it remains a Class 3 repair regardless of the extent of the repairs on the old firebox. If Classes 3, 4 and 5 were each subdivided into two or three sub classes, it would be possible to determine more accurately the extent of the work done and to make a more intelligent comparison of the output and cost in different periods. This would not be entirely satisfactory as a statistical check, but it would at least be a step in advance of the present method.

Another method used is to compare the cost of the classified repairs with the mileage of the same locomotives since the previous shopping. As a check on the cost of locomotive repairs by types of locomotives, this is quite satisfactory, but as a measuring stick of output or efficiency of the shop, it is not particularly valuable. This is due to the fact that a big mileage between shoppings with the resultant low cost is more likely to be due to good facilities and adequate maintenance at roundhouses. Efficient shop operation is shown by turning out the locomotives at the lowest cost of doing the required work.

No Adequate Measure of Round-House Repair Work

In measuring the output of round houses, the statistics now generally available are just as unsatisfactory as those showing the output of shops. As a rule, information is available showing the number of engines dispatched and the cost of light or running repairs per engine dispatched is of some value in checking the trend of performance for the entire railroad over a considerable period of time. The same is true as to the use of the cost of running repairs per locomotive-mile. Both of these units, however, are of little value in checking the efficiency of an individual round-house. The unit of locomotives dispatched is a decidedly variable one, especially when applied to running repairs. A locomotive may have practically no work performed on it, except inspection. On the other hand, the work performed, especially in a boiler-wash period, may amount to several hundred dollars per locomotive. It is logical in the boiler-

wash period that shoes and wedges should be lined up, rod brasses renewed, rods adjusted and other miscellaneous repairs on the machinery performed. Naturally, it is illogical to give a locomotive upon which little is done, except inspection, the same credit in output as work performed at boiler-wash periods. Yet, in the use of engines dispatched as a measuring stick, no differentiation is made between these locomotives. There is substantially no measuring stick of the output of round houses, which, from a general statistical standpoint, is of any value whatsoever. Eventually there must be worked out a system of measurement of output in light and running repairs, showing the number of engines upon which the more important items of light repair work are performed. Otherwise, an even more elaborate system such as will be later described, must be instituted.

What has been said as to the statistical measuring stick of round house repair work is also true as to the round house transportation work. The item of "Engines Dispatched," which is most commonly used, includes engines on which no work is performed except being turned on the turntable and given coal and water, while it also includes engines on which the fires are cleaned or dumped, boilers washed, fires built up and the engine cleaned. The transportation side of the engine-house performance could be checked by statements indicating the number of locomotives on which the various classes of work were performed. As a matter of fact, such reports have been in use on one or two railroads with considerable success. The use of the engines dispatched, however, in checking transportation or maintenance work at individual round houses is of little value.

Statistics of Car-Shop Output

What has been said with reference to statistics of output of locomotive shops, applies equally to the statistics of output in car shops. Substantially all railroads have statistics as to the number of cars given heavy and light repairs. In most cases, heavy repairs include all repairs requiring more than 20 man hours of work. In addition to this, many roads have four or five classes of repairs, these classes being based upon the number of man-hours required to do the work. The basis for these subdivisions of heavy and light repairs, however, differs considerably on various roads and are not comparable. Even on one railroad, the use of the number of cars given the various classes of repair is of little value. The character of the work in different periods for different shops differs widely. Moreover, the classifications of repairs cover such a wide variation that the same class of repair may include work on one car substantially double the amount upon other cars. For example, on one railroad Class 1 repairs include all repairs in excess of 175 hours. Class 2 repairs include all repairs in which the man hours exceed 72 hours but are less than 175 hours, and Class 3 repairs include all repairs in which the man hours vary from 36 to 72. It is obvious that the character of work on different cars being given the same class of repair may vary to a very marked extent. When an attempt was made to equate the various classes of repair to an equivalent of a Class 1 or Class 5 repair it was found almost impossible to obtain any logical results.

Passenger Car Repairs

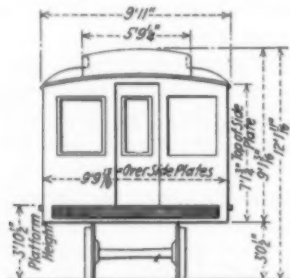
The same facts apply in connection with passenger train car repairs. In passenger car repairs the usual basis of the classification is the painting done. Where paint is burned off, it is considered a Class A or general repair, and where the painting is not burned off, it is considered a minor repair. In many cases, no account is taken of the extent of the renewal of sheets or sheathing, floors or roofs or the extent of the upholstering or other work in the interior of the car. As an example of the illogical way in which this

works out from a statistical standpoint, a specific instance is given. A special type of passenger car was rebuilt at a cost of in excess of \$25,000 and it was considered in the shop report as a heavy repair. In the same shop on the same railroad on another passenger train car, the paint was burnt off, the trucks and running gear repaired and upholstered and interior work overhauled and repaired at a cost of approximately \$6,000. Obviously, when both of these cars are included in the same class of repairs, comparison as to output of a shop in different periods on the basis of the number of heavy and light repairs is worthless.

Summarizing the general statistics as to output, it is clear that from a statistical standpoint the figures as to output which are more or less generally used are of little or no value. While the mechanical officers have the full detail as to exactly what was done on individual locomotives and, in some cases, individual cars, the general information available provides no sound basis for judgment. The classifications include work of such varying nature that the units used do not describe the amount or character of the work performed by the railroad or shop during the period. It would seem that at least an improvement could be made by sub-dividing the classes now in use so that the units of output will be more nearly standard than is the case at the present time.

Plans for the Baltimore & Ohio Electrification on Staten Island

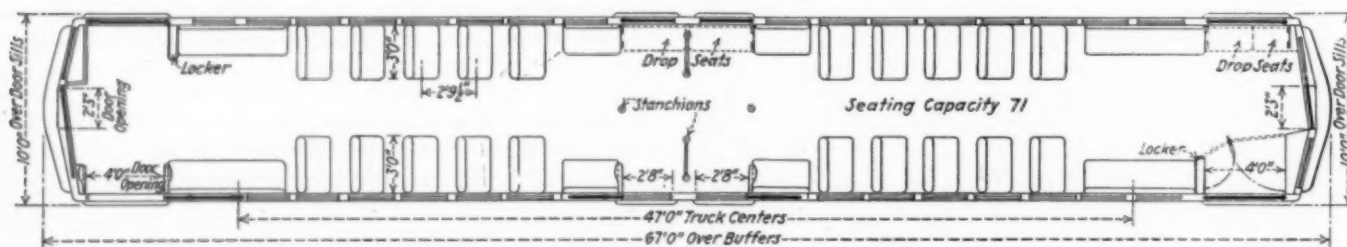
THE STATEN ISLAND RAPID TRANSIT RAILWAY COMPANY will electrify its passenger service on the East Shore division and the Perth Amboy division as rapidly as plans can be developed and the work executed. This includes the lines between St. George, South Beach



End Elevation of One of the Multiple Unit Cars

and Tottenville, Staten Island. The total track mileage which will be electrified at this time is approximately 40 miles.

The 600-volt direct-current third-rail system will be em-



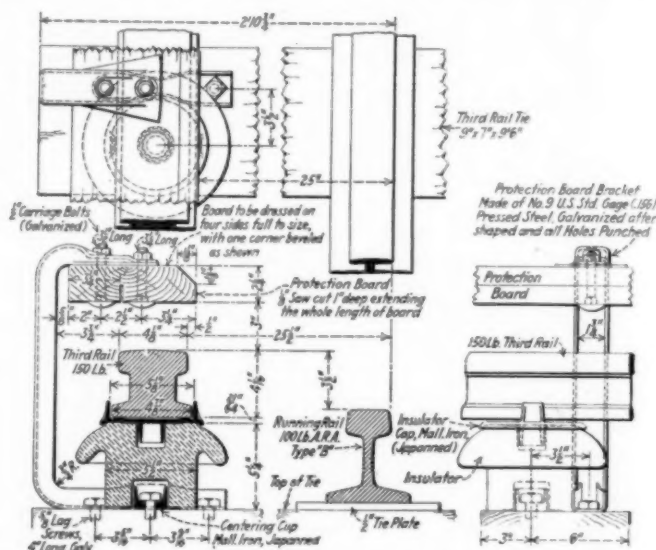
Floor Plan of One of the Multiple Unit Cars

ployed. Preliminary plans include an over-running protective type of third-rail construction with 150-pound third-rail of special high conductivity steel on main lines.

It is probable that electric energy for multiple-unit operation will be purchased from the Staten Island Edison Cor-

poration. Tentative plans cover 33,000-volt, three-phase, 60-cycle power supply to be delivered to the railway company's substations where the high potential alternating current will be transformed and converted for feeding the 600-volt direct-current third-rail. Several of the substations will be of the automatic or remote control type. The substation layout is designed to provide power facilities for a considerable increase over the present requirements.

The multiple unit car which will probably be adopted will be of all-steel construction approximately 67 feet overall in length and of modern design throughout. The car will seat 71 passengers. There will be double doors at the center and a wide door in the side at each end of the car with end doors to permit passing between cars. All side doors will be electro-pneumatically operated. Each car will



Boiler Makers' Convention Held in Chicago

Apprentice Training and Effect of Syphon on Firebox Maintenance Among Subjects Discussed

THE OPENING SESSIONS of the fifteenth annual convention of the Master Boiler Makers' Association held at the Hotel Sherman, Chicago, May 20 to 23, were attended by about 300 members of the association and 125 representatives of member companies of the Boiler Makers' Supply Men's Association. Exhibits were shown by 57 companies belonging to the supply association.

E. W. Young, assistant to the general superintendent of motive power of the Chicago, Milwaukee & St. Paul, president of the association, called the meeting to order Tuesday, May 20, at 10 a. m. Following the usual opening exercises, H. T. Bentley, general superintendent of motive power, the Chicago & North Western, was then introduced and, in an address to the men on their duties as the leaders in locomotive boiler maintenance work, expressed his appreciation and admiration of all craftsmen who have gone through the arduous days of the apprentice and journeyman and finally reached their positions as the masters of their trades. These men in whose hands rest the responsibilities of properly conditioning the motive power of the nation, Mr. Bentley said, should strive to be worthy of their trust and in every way better themselves in their work, and the managements of the railroads should see to it that their master boiler makers were present at the conventions.

On the technical phases of the work of the association, Mr. Bentley expressed the hope that the association in its discussions would be able to throw light on the problem of pitting and corrosion of boilers, which so far has found no solution in the laboratory or in the hands of practical investigators. He outlined the need of apprentices in the shop who would later on be fitted to carry forward the work of the masters of the trade who were retiring. Water treatment and its value in cutting, operating and maintenance expense in bad water districts, quality of material and possible improvements, and the work of the chief inspector of the Bureau of Locomotive Inspection in developing and standardizing the use of water columns, were all commented on in his address.

The president's annual address which followed was mainly devoted to an outline of the duties of members of the association in faithfully attending all sessions of the convention and getting the maximum benefit out of the proceedings to improve methods in their own shops when the convention was concluded.

The reports of the secretary and the treasurer indicated that both the membership and financial conditions of the association were showing a healthy growth, with few resignations.

A communication from Hon. Herbert Hoover, secretary of the Department of Commerce, was read by the secretary asking for the co-operation of the association in improving the movement of coal during the summer and early fall months of the year. A memorandum promising the co-operation requested to the best of the ability of the members in their capacities in the maintenance of motive power of the country is to be prepared and forwarded to Mr. Hoover.

An invitation to send a representative to sit in on the Advisory Council of the Federated American Engineering Societies is being acted on by the executive board of the association.

After the conduct of routine business, the first session closed with the discussion of the advisability of the association putting in code form for suggested use of the members

and as their best advice on boiler methods, certain methods that have been developed in boiler work that are amenable to such codification. Three subjects suggested for early action were autogenous welding; how and where it should be used, and what tools and methods can best be adopted as standard in locomotive boiler work; flue welding and the proper methods of applying flues, and methods of staying crown sheets.

The Wednesday session opened with an address by J. E. Bjorkholm, assistant superintendent motive power, Chicago, Milwaukee & St. Paul, in which he emphasized the duty of every railroad officer to improve service with safety. In this the boiler maker has a most important duty, the promotion of safety through proper maintenance. Boilers are sometimes responsible for engine failures, but their number is fast decreasing. Clean boilers are safe boilers and the importance of keeping them free from scale and mud cannot be too strongly stated. No locomotive is usable unless boilers are in proper condition and officials are beginning to recognize the importance of boiler makers in maintaining service.

Training Apprentices

The great need of this country today is a revival of respect for genuine old time skilled craftsmanship. There is a growing conviction among thoughtful men that a grave mistake has been made in making apprentice restrictions too drastic. It requires youth and vitality to make anything a success these days, and the skilled trades are no exception to the rule.

It is recognized that the best results in apprenticeship can only be accomplished by educational facilities on the shop property during working hours with the apprentice under pay, combined with shop instruction, conforming to a regular schedule of advancement.

Never was there so great a need for skilled mechanics as there is today, but we cannot develop real mechanics unless a definite and adequate plan of training is adopted and rigidly adhered to. A thorough course training for each trade must be laid out and some one must be responsible for seeing that each boy is carefully conducted through the course. There must be a definite amount of school instruction in order that the boy may be given a thorough understanding of the underlying principles of the job. Means must be provided to insure thorough training of the apprentice in the shop work, by the use of shop instructors who devote their entire time to the instruction of the apprentices, directly on the work in which they are engaged in the shop. It has been demonstrated that the use of a shop instructor as indicated, results in a material increase in output, and is therefore immediately profitable to the railroad company, as well as ultimately beneficial in providing a group of well trained and well intentioned graduates to fill the places made vacant by promotion or other causes.

It has been found that the best results in apprenticeship training are accomplished by a plan embodying instruction in the standard practices of the railroad company and all lesson papers and shop instructions should be arranged with that object in view in order to thoroughly drill the apprentice in the company standard practices, at the same time he is being taught drawing, mathematics, and shop methods.

A number of railroad companies have a very complete apprenticeship system extending over the entire railroad and

in successful operation for a number of years. Usually there are three groups of apprentices, as follows:

Classes of Apprentices

Regular apprentices should be boys 16 to 21 years of age, having a high school education or equivalent, and in good health. Schools be maintained at the shops, four to six mornings per week. Attendance be compulsory and under pay, but the minimum requirements not severe. Each apprentice be given instructions in mechanical drawing, shop mathematics, physics and related subjects during two periods of two hours each per week. It will be realized that many boys who have not had much early education, still have good intentions and respond to a genuine opportunity to improve their condition by attending the schools. The course in each of the mechanical trades is for four years in school and shop. The shop to have an instructor to supervise the movements of the apprentices in the shops, give them instructions in the proper methods to follow and arrange for them to be moved in accordance with the schedule established for each trade. The shop instructors should not assign work, but instruct the apprentices in the work which the department foreman has assigned to them.

The lesson papers, drawings, problem sheets, tee squares, angles, pencils, paper, and everything except the set of drawing instruments should be furnished by the company. The instruments can be purchased by the instructor for the apprentice at a reduced rate made with the manufacturers.

Helper apprentice should be young men 21 to 30 years of age, in good health, who have had two or more years continuous experience as helper in the shop from which application is made, should be given one year allowed time and serve a three-year apprenticeship course. Attendance at the school could be optional for helper apprentices. The shop instructors also should look after the progress of the helper apprentice.

Special apprentice should be young men 18 to 26 years of age, who are graduates of a mechanical engineering course in college and have good health. They can be placed on the regular work in the shops and assigned to special work on tests and selected duties as required. These men need not attend the shop schools.

Many men now occupying good positions in railroad service are graduate apprentices of different railroads, it may be said that the railroad service offers as good opportunity for the future as any other line of work. It should be pointed out that ability to acquire knowledge is not alone sufficient to insure advancement in the service; some other desirable characteristics such as executive ability, initiative and common sense are necessary, and are sometimes unexpectedly developed after a period of experience. Many of these men have been advanced to good positions. This plan, we believe, will help materially, to increase the bond of mutual interest between the company and the employees.

The plan of apprenticeship should include the boiler-maker's trade with others, in the manner described. This trade should be more attractive to young men than heretofore on account of the introduction of labor saving tools and appliances and improved methods. There is an excellent opportunity for young men who are thoroughly qualified to advance beyond the position of workman.

This report was signed by the following committee: George B. Usherwood, N. Y. C. (chairman), W. J. Murphy (Penna. System), John Harthill (N. Y. C.) and John F. Raps (I. C.).

Discussion

The Santa Fe system has developed the training of apprentices to a high degree to include not only shop and school training, but physical training in the form of competitive sports between schools at different points. Boys are

taught to ask questions and to carry responsibility of making locomotive investigations. Their findings are carefully checked later. The practice of having hours of instruction evenings is advisable as it causes no loss in production. So far as possible boys are placed on their own responsibility. Ninety per cent of the apprentices trained on the Santa Fe have remained on the road. The sentiment of the meeting was that a carefully planned system of apprentice training was almost a necessity and would do much to relieve trouble in operating shops.

The Application of Thermic Syphons

The committee investigating this subject reported that the application of thermic syphons increase the life of firebox sheets and flues, basing its belief on the following facts:

By the application and use of thermic syphons a very active circulation of the boiler water is set up and maintained. The circulation, sweeping all parts of the boiler, tends to equalize or reduce the range of temperatures of the boiler parts which would be exposed without thermic syphons. This in turn reduces the stresses that are accountable for cracks, leaks and heavy maintenance expenses.

Many reports were received showing a reduction in boiler work in general repairs, when the locomotive was syphon equipped, as compared with non-syphon equipped locomotives of the same class and service. The committee is also of the opinion that the thermic syphons will be a great help to the crown sheet as they cause a fountain action of the water on this sheet and prevent it becoming overheated. The committee expressed the opinion that the thermic syphon also acts as a substantial support for the crown sheet in cases of emergency. Syphon equipped locomotives have successfully passed through low water accidents. The unusual shape of the overheated area clearly proves that the water continued to flow over the crown sheet after other water protection had ceased.

The following extract from circular No. 260 of December 12, 1923, issued by A. G. Pack, chief of the Interstate Commerce Commission, Bureau of Locomotive Inspection, Washington, D. C., was offered to substantiate their findings:

"We are receiving many alteration reports from a number of different carriers showing the application of thermic syphons and, so far as it has been brought to my attention, there has nothing yet been developed which would indicate a reason why their use should not be extended. They add materially to the direct or firebox heating surface and improve water circulation, which is essential to economical and successful boiler operation, and will deliver a certain amount of water to the crown sheet after it has become below this level, which may obviate what otherwise might become a serious explosion with fatal results.

"Syphons also add some beam and brace support to the crown sheet—they being attached to the crown sheet and at the throat sheet—which may prevent the crown sheet from coming down with a crash in case of low water."

This report was submitted by the following committee: A. F. Stiglmeier (N. Y. C.), Chairman; Henry J. Rapps (I. C.); John J. Keogh (C. R. I. & P.); H. J. Wandberg (C. M. & St. P.) and A. C. Dittrich (M. St. P. & S. S. M.).

Discussion

That success has been quite general with syphons was evident from the discussion. Troubles experienced since its introduction have been largely overcome. A statement by the chairman of the committee indicated that it was not possible as yet positively to determine whether the syphon increased the life of the firebox sheets or not, but that it was the committee's belief that it would eventually do so. This view was borne out by A. G. Pack, chief inspector, Bureau of Locomotive Inspection, who stated that no syphon had been

operated sufficiently long to decide what effect it would finally have on the life of fire boxes, the earliest installation being only five or six years old. No improvement in locomotive construction has been perfect at the beginning, but the syphon is proving of real value in extending the life of fire-box sheets, according to his observations. Various blisters and cracks on syphons have been traced to oil, chips and dirt not being properly cleaned out at the time of installation. The evidence submitted indicated that syphon equipped engines are freer from leaks in service. An example of fuel savings on 25 Pacific type Chicago & North Western loco-

motives was given as 5 to 16 per cent. Rapid circulation, promotion of evaporation and constant steaming were given as reasons for the success of the syphon in decreasing pitting and corrosion and promoting efficiency.

Other Reports

Other subjects on which reports or papers were presented are, Shop Kinks, Autogenous Welding, Removing Firebox Sheets for Renewal, Causes and Prevention of Boiler Pitting, and Washing Boilers. A brief account of the closing proceedings will appear in an early issue.

Boston & Maine Again Fails to Earn Charges

Has 1923 Deficit of \$3,491,070 Due to Severe Weather and Heavy Equipment Maintenance Expenses

THE YEAR 1923 was for the Boston & Maine another eventful but disappointing one, added to the long list of eventful but disappointing years through which this carrier has passed during the last two decades. For the year, the road had a deficit after fixed charges of \$3,491,070, making 1923 the poorest year from this standpoint in its history with the exception of 1920, when there was a deficit

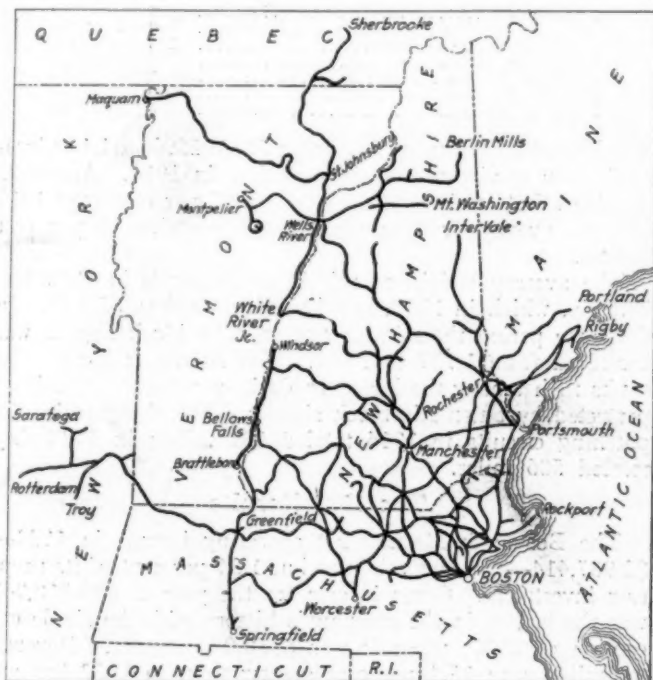
a poor start for the year that improvement in later months could not overcome it. For the latter nine months of 1923, net income after fixed charges amounted to \$1,078,820, an increase in net of \$372,431 as compared with the corresponding period of 1922. In the first three months of the year, however, the deficit after fixed charges amounted to \$4,569,890, which deficit the results of the last nine months succeeded only in reducing to \$3,491,070.

Effect of Strike on 1923 Net

The second of the two principal reasons was the result of the bravery which a road in the poor financial condition of the Boston & Maine showed in fighting the shopmen's strike of 1922. The management ultimately won the contest with its strikers and its courage was rewarded not only by the victory secured, but also by a favorable attitude on the part of the shippers in Boston & Maine territory and, most important of all, by an improved employee morale. The last named has, of course, been assisted by various other factors. Much of the cost of the shopmen's strike of 1922 was reflected in the 1922 accounts but there remained from the strike a heritage of bad order equipment and many transportation difficulties corollary thereto which increased 1923 costs. The coal strike of 1922 also had 1923 effects. It had made necessary the purchase of large quantities of foreign coal which, besides being high priced, was not adapted for use on Boston & Maine locomotives. Much of this coal was still on hand in the early months of 1923 and its use was accompanied by an increased number of steam failures.

There were few of the country's railroads that were not affected to some extent at least by factors such as these in 1923. The reason that the situation should have affected the Boston & Maine so adversely as it did is essentially that the Boston & Maine lacks many things that it must secure before it can again become a prosperous and efficient operating property. The road suffers from the various handicaps that confront the New England roads, all of which have received attention in this and other publications and which have been discussed at great length, notably in connection with the New England divisions case, the Storow report, etc. The Boston & Maine suffers more than from anything else, from the fact that it has an inadequate physical plant and from financial inability to make necessary improvements to bring about economy or operating efficiency. In simplest terms, it is in a position such that it cannot, so to speak, "live on its fat" in poor years. It has had no good years for so long a period that it has no fat on which to live.

The Boston & Maine has been under its present management for a period of ten disappointing years. During this



The Boston & Maine

after fixed charges of \$6,612,421. In 1922 there was a net after charges of \$27,991.

Net railway operating income or net after equipment and joint facility rents in 1923, was \$2,987,414, as compared with \$6,475,740 in 1922. The 1923 net operating income was equivalent to but 30.4 per cent of the road's standard return based on the average net operating income for the three years ended June 30, 1917. The 1922 net had been the best reported since the beginning of federal control and it was equivalent to 66 per cent of the standard return. There were two principal reasons why the improvement effected in 1922 was not carried over into 1923. One was the severe weather of the first quarter of 1923, which gave the road such

decade it has gone through a receivership and reorganization, through the period of federal control and through that period of uncertainty and difficulty which followed federal control and which lasted, let us say, up to the beginning of 1923. The present management, besides having to contend with the difficulties contained in these circumstances has also had to overcome a heritage in which are embodied many adverse conditions. Present Boston & Maine conditions cannot be realized without realization also of the situation of ten or more years ago. When the new management took hold of the property, the Boston & Maine had a floating debt of \$24,310,000 made up of 6 per cent one year notes. The road had, for a period of several years, been paying dividends that it had not earned. These had amounted to 6 per cent on the preferred stock and had been at a decreasing rate on the common, ranging from 7 per cent in 1908 down to but 3 per cent in 1913. No dividends were paid in the fiscal year ended June 30, 1914. In that year there was a deficit after charges of \$2,044,742. At the end of 1914 there was a cumulative deficit from 1908 of no less than \$5,547,128.

Non-Dividend Preferred In Place of Guaranteed Rental

The most important difficulty and the essential reason for this situation was the Boston & Maine's corporate structure. The Boston & Maine owned but a comparatively small proportion of the system that it operated. The larger part was in the form of leased lines, to the owner companies of which the parent company was paying rentals at a rather high rate. These rentals for leased roads totaled over \$5,000,000 annually, whereas interest charges were only about \$1,750,000, or later about \$3,000,000. In the reorganization the leased lines were merged and in place of the stock of the individual companies on which dividends had been guaranteed the holders received Boston & Maine preferred stock. There are several series of this stock supposed to receive dividend rates of from 3.6 to 8 per cent, depending upon the series, the different rates being explained by the differing dividend rates on the stock of the former leased roads for which the new preferred was exchanged. The full dividends were paid in 1919, the first year after the reorganization—this result being possible because the corporation had the benefit of the federal control rental. In 1920 the preferred dividends were paid for the first half-year only and none have been paid since. The unfortunate situation of the holders of the preferred stock who now own stock receiving no dividends whereas they formerly held stock on which dividends were guaranteed, is readily realized. It at least offers the management a difficult problem in what might be termed "stockholder relations."

Capital Improvements

The Boston & Maine has, notwithstanding its financial difficulties, been enabled to spend some money for capital improvement during the past few years. The funds for that purpose were supplied in the form of loans from the government. Such government loans have totaled \$50,614,479, of which \$28,909,000 was in loans from the Railroad Administration in connection with the reorganization and \$21,705,479 was from the revolving fund established by the Transportation Act to assist the transition from federal to private control. These figures are in addition to payments for the standard equipment allocated by the Railroad Administration which were financed by the equipment trusts relating thereto. The gross expenditures for additions and betterments to the property between July 1, 1914, and December 31, 1923, have exceeded \$45,000,000. Some \$25,000,000 was for new equipment or improvements to existing equipment and the balance has been applied to shops and engine-houses, roadway, yards and additional trackage, and for renewing bridges. One of the outstanding details was the purchase of 20, and later 10 more, Santa Fe type locomotives for use

on the Berkshire division between Rotterdam Junction, N. Y., and Mechanicville on the one end and East Deerfield, Mass., on the other. To make the use of this modern power possible it was necessary to strengthen the bridges on the division and build new engine terminal facilities at East Deerfield. This division is practically the only one on the Boston & Maine that is operated with what can properly be said to be modern power. This means that the progress made is thus far only in its beginning.

Other improvement in equipment has been made as follows:

	In 1914	In 1923
All-steel passenger cars.....	10	136
Steel underframe passenger cars.....	221	825
Wooden freight cars.....	15,780	2,523
Freight cars equipped with steel underframes or steel center sills.....	7,630	16,272
All-steel freight cars.....	1,494	1,472

The number of freight cars decreased about 19 per cent in this period but by reason of an increase of approximately 10 per cent in the average capacity per car the decrease in aggregate capacity amounted to about 11 per cent. The Boston & Maine is usually considered to lack sufficient freight equipment. It always reports a heavy debit per diem balance which situation, however, may, of course, be due to other causes, incident, notably, upon its being a terminal road. In 1923 the road had a debit per diem balance of \$4,853,532. This compared with \$3,740,761 in 1922, and it was the heaviest debit per diem balance that the road has ever reported.

Progress with reference to locomotives is shown as follows:

	In 1914	In 1923
Superheaters.....	93	397
Electric headlights.....	0	1,100
Automatic fire doors.....	170	330
Power grate shakers.....	0	66
Feedwater heaters.....	0	20
Mechanical stokers.....	0	30
Power reverse gears.....	0	73

The Boston & Maine on December 31, 1923, had 1,100 locomotives in service which was less than in 1914. Aggregate tractive effort at the end of 1923 was 7 per cent over 1914 and the average tractive effort per locomotive 18 per cent greater.

The average weight of rail in main tracks in 1914 was 78.5 lb., which in 1923, had been increased to 83.5 lb. In the same period the mileage protected by block signals was increased from 1,727 to 1,814. The Boston & Maine now ranks fifth among the larger roads in percentage of mileage protected by automatic block signals. Telephone train dispatching circuits in 1914 totaled 231 miles; in 1923 they totaled 506 miles.

The 1923 Results

The Boston & Maine's net operating income in 1923—\$2,987,414—was equivalent to but 1.24 per cent of its property investment. Gross income for the year of \$86,310,941 was the largest in the company's history with the single exception of 1920, when it was \$350,000 greater. Revenue ton-miles were 15.4 per cent greater than in 1922 but not as great as in any of the years from 1916 to 1920 inclusive. In 1923, the revenue per ton-mile was 1.717 cents; in 1920 it was 1.439 cents and became 1.783 cents in 1921.

The operating ratio in 1923 was 87.1 which compared with 84.3 in 1922. The ratio of transportation expenses to total revenues was 47.2, comparing with 45.7 per cent in 1922 and, except for 1922, was the lowest figure reported since 1916.

The total operating revenues in 1923 of \$86,310,941 were 8 per cent in excess of those of 1922. The operating expenses, totaling \$75,275,588, were 12 per cent greater. This increase in expenses was in the transportation and maintenance of equipment accounts. The transportation expenses increased 11.5 per cent. The maintenance of equipment expenses increased 21 per cent. The reasons for the increase

in transportation expenses and for the high transportation ratio have already been noted as the severe winter weather, the transportation difficulties resulting from the shopmen's strike and the use of foreign coal. Locomotive fuel expenses in 1923 took 12.2 per cent of total operating revenues.

The increase of 21 per cent in maintenance of equipment expenses was a result of the shopmen's strike of 1922, which left the road with a large proportion of its equipment in bad order. After the strike the road had fair success in building up new forces but it, nevertheless, had to have considerable repair work done in outside shops. The maintenance of equipment expenses in 1923 were larger than for any previous year with the exception of 1920. The 1923 total, as noted, was 21 per cent greater than in 1922. The increase in the primary account of locomotive repairs as between the two periods was 51 per cent; in freight car repairs 46 per cent. It is of interest that the total amount charged to maintenance of equipment in 1923 was 275 per cent of the amount charged to this account in 1917. Notwithstanding the unusually heavy maintenance of equipment expenses in 1923, the Boston & Maine does not seem to have made marked progress in catching up on deferred equipment maintenance. Bad order cars on January 1, 1923, were 11.8 per cent of the total on line. On January 1, 1924—one year later—the percentage of bad order cars was 12.9. On March 15, 1924, it was 13.1 per cent. The percentage of locomotives unserviceable on January 1, 1923, was 23.7 per cent. This percentage was gradually reduced during the course of the year but it rose again so that on January 1,

"As stated in the 1923 report, it is unwise to make predictions in view of the many factors which may affect both revenues and expenses.

"There are, however, many hopeful signs which indicate that results may be expected which will be better than those during the recent abnormal years. Active progress has been made in the matter of through freight rate divisions. A larger proportion is being received from express traffic than prior to the war. A schedule of mail pay has been authorized which is about 35 per cent higher than for the country as a whole. A recent increase in commutation rates has been granted which should place this class of traffic more nearly on a paying basis. With these developments, and with a reasonable volume of traffic, it is hoped that a substantial improvement in earning power will develop.

"But there is one phase which I regard as even more important than the others, and that is the improved and improving relationship toward the property on the part of the employees.

"There is manifest an increasing preference for adjusting local differences directly between our own officials and representatives of the employees concerned, without resort to outside agencies. In accord with this tendency, an adjustment board with powers of final decision on matters coming within its scope has been set up in one department of the service, under the provisions of the Transportation Act. In 1921, the Boston & Maine joined with two other railroads in establishing in New York a regional board for the adjustment of train service matters, and in the great majority of cases decisions have been reached without necessity of further appeal. The association of employees in the mechanical department has its own system for adjustment of whatever questions may arise, without outside recourse. Our foremen in the mechanical department have formed associations among themselves for educational work in shop practices and the proper handling and instruction of men, and are inviting representatives of the mechanical employees to some of their meetings, in further evidence of the growing sense of common interest in the development of efficiency. Some of the talks on right principles of supervision,

BOSTON & MAINE OPERATING RESULTS, SELECTED ACCOUNTS, 1914 TO 1923

Years ended June 30	Total operating revenues	Maintenance of way and structures	Maintenance of equipment	Total operating expenses	Op. Ratio	Net operating revenue	Gross income	Hire of freight cars	Rent for leased roads	Interest and discount	Net income
1914	\$48,160,286	\$6,700,913	\$7,835,146	\$38,856,219	80.7	\$9,304,067	\$9,151,645	\$1,583,774	\$5,487,629	\$3,592,053	—\$2,015,957
1915	46,673,049	7,197,017	6,697,311	35,909,722	76.9	10,763,277	9,983,584	1,196,325	5,589,406	3,026,561	—305,677
1916	52,075,428	5,986,603	6,588,044	36,197,959	69.5	15,877,469	15,059,293	2,074,248	5,626,029	2,725,477	4,147,695
Dec. 31											
1916	55,383,545	6,132,044	7,088,573	38,251,716	69.1	17,131,829	16,221,591	2,561,724	5,659,634	2,621,364	4,876,929
1917	59,450,779	6,192,311	8,786,745	47,164,941	79.3	12,285,838	11,358,313	2,954,175	5,695,962	2,523,024	—334,277
1918	70,157,584	10,061,998	14,231,202	64,779,651	92.3	5,377,933	10,208,229	1,526,911	5,562,924	2,522,643	257,901
1919	72,935,146	9,612,461	15,287,526	67,144,063	92.1	5,791,083	9,262,582	877,363	928,550	4,440,478	2,657,523
1920	86,652,745	15,093,264	20,168,923	90,989,432	105.0	—4,336,687	11,933,384	4,416,809	927,845	5,310,330	614,729
1921	78,289,750	13,021,679	15,920,613	73,833,742	94.3	4,456,278	4,171,936	3,193,312	923,181	6,066,567	—6,612,421
1922	79,720,085	11,136,236	16,093,525	67,164,593	84.3	12,555,492	11,311,890	3,740,761	920,376	6,038,772	27,991
1923	86,310,941	11,546,362	19,489,240	75,275,588	87.1	11,035,353	9,357,621	4,853,576	902,363	6,319,301	—3,491,070

1924, it was 22.4 per cent. At that time the average for all roads was 16.1 per cent. Locomotive condition reports have, since the middle of January, been on a new basis. On March 15 the Boston & Maine's proportion of unserviceable locomotives was 26.7 per cent whereas the average for the country, on that date, was 19.1 per cent.

The Boston & Maine has had much greater success this year than it had in the early part of last year. The report for the first quarter of the present year will probably show a deficit after charges of not more than \$500,000. There was a deficit in the first quarter of 1923 of \$4,776,782 and in the first quarter of 1922 of \$852,097.

The Future

President Hustis, at the recent annual meeting of the Boston & Maine stockholders at Boston reviewed in his remarks the activities of the Boston & Maine for the ten-year period during which he has been its head. Much of the statistical data contained in the foregoing is from the statements which he made at that time. President Hustis made no attempt to minimize the difficulties which have confronted the management. He expressed regret that the stockholders had not fared better in the trying period. He did not express any views to the effect that the trying conditions were gradually being brought to an end but he did point out the things that were being done to assist in securing betterment of the situation. In this connection he said:

given by foremen at these meetings, and published for distribution, have attracted wide attention. There is reason to believe that the enlarged employees magazine, for exchange of information and suggestions, and the periodical joint conferences of the safety, fuel saving and freight claim prevention committees, will serve as means of wider personal acquaintance and better understanding of the problems involved in successful and economical operation."

The Relation Between Boiler Scale and Train Speed

By P. M. LaBach

Engineer Water Service, Chicago, Rock Island & Pacific

A NUMBER OF TESTS have been made which show that the scale accumulating on tubes and sheets of locomotive boilers when water is evaporated prevents a portion of the heat generated by the fire from reaching the water and consequently cuts down the number of pounds of steam that can be obtained from a pound of coal. That the effect of this upon locomotive operation may be pronounced can be gathered from the accompanying chart which is useful particularly in showing the reduction that takes place in the speed of the train. This chart is prepared in the following manner:

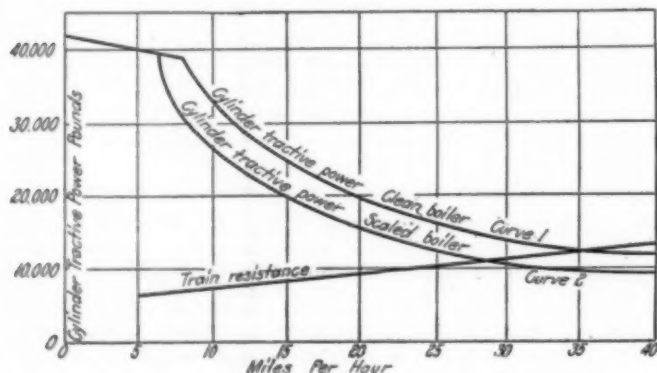
It has been demonstrated that the number of pounds of

coal which can be burned on each square foot of a definite grate area for efficient combustion has a maximum which does not vary except with the temperature of the air. Where stokers are not used the factor is also governed by the number of pounds of coal the fireman can shovel per hour. These two factors being known from tests, the cylinder tractive force for an engine in perfect condition can be determined for all speeds. Curve No. 1 on the chart gives these values for an ordinary consolidation superheater freight locomotive of 42,000 lb. tractive power. Curves of this type are in general use by motive power officers. To show the method of its use, if it is desired to know how much tractive force the engine has at 35 miles an hour, a line is extended from the 35 mile point on the horizontal scale upward until it intersects the curve, after which a line is drawn from that point on the curve horizontally to the vertical scale on the left of the drawing where the tractive force is found to be 12,200 lb., or less than half that of the starting power.

Since, as was said at the outset, the effect of scale is to reduce the amount of heat generated for each pound of coal, it is obvious that if the same rate of combustion is obtained in the firebox the force curve will be materially changed by the presence of scale in the boiler. It is not uncommon in bad water districts for flues to be covered with $\frac{1}{8}$ in. of hard scale. According to the tests made by the University of Illinois the effect of such scale is to reduce the tractive force 20 per cent. See curve No. 2 on the chart.

The third line on the chart is the curve of train resistance, which in this case gives the tractive force required to overcome train resistance at different speeds on level track. All that is needed to produce this curve is the angle which the curve makes with the horizontal at a given speed.

Let it now be assumed that a locomotive with clean boilers is given a load which it can haul at 35 miles an hour on a level grade and that it is desired to determine what the effect



A Chart to Show the Effect of Boiler Scale on Train Speed

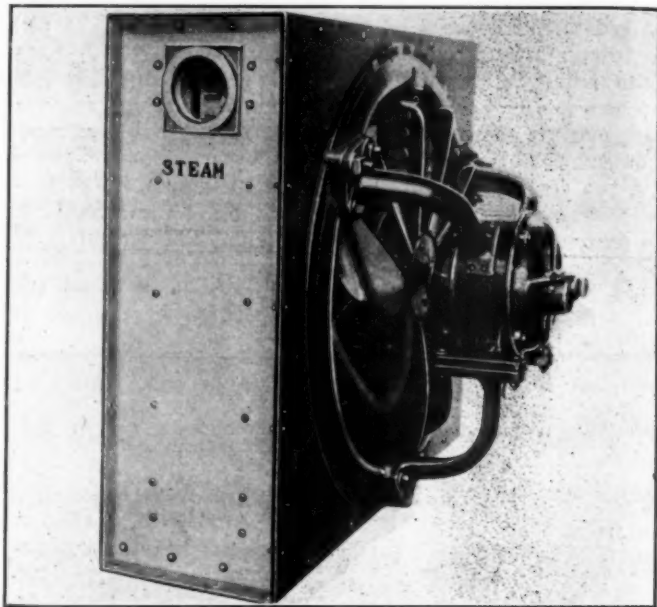
would be if the flues carried $\frac{1}{8}$ in. of hard scale. This is readily ascertained from the chart by following the train resistance curve until it intersects curve No. 2, which shows a speed of 28.6 miles per hour. The scaling of the boiler thus cuts the maximum speed of the locomotive from 35 miles an hour to 28.6 miles an hour.

In actual practice, when the boiler is scaled up the attempt is often made to maintain the same speed as before. To accomplish this more coal is fired per square foot of grate area, if possible, but with the result that the increase in speed is not proportional to the increase in firing. For instance, an increased rate of firing of 25 per cent might only increase the speed 20 per cent. Moreover, in the case of hand firing the fireman himself is usually the limiting factor. If he did his best at 35 miles an hour in the first case given, the locomotive will only make 28.6 miles per hour unless the tonnage is cut down. Thus, in any event a loss is suffered by the presence of scale since the scaled boiler simply means a smaller engine or less horsepower than a clean boiler

Motor-Driven Heater for Shop Buildings

A MOTOR-DRIVEN HEATER, known as the Venturafin, has been placed upon the market by the American Blower Company, Detroit, Mich. It is so designed that cold air may be taken in from near the floor and discharged, thoroughly heated, at a height of about seven feet. This provides constant and complete circulation of all the air in the room. Each unit is furnished complete, including a heater and standard motor-driven fan which forces the air over the heating surface. Its compactness and simplicity make it easily adapted to a variety of arrangements.

The steam coils used in the heater are made from copper and brass so as to decrease the resistance to the transmission



This Heater Provides Complete Circulation of all the Air in the Room

of heat. The tubes also are made up of straight, seamless copper and brass tubing, about which is helically wound a copper ribbon in such a way that it forms a continuous fin. This fin is bent in such a way that a large surface is in contact with the outer surface of the tube, and is treated so that the fin and tube become integral. The integral construction insures free transmission of heat from the tube to the fin and from thence to the air passing through the fins. It is estimated that with this construction the heat transmitting surface is made nearly five times greater than that of the tube alone.

The tubes are arranged in rows, usually three deep and staggered. The ends of the tubes are pressed into a thin flexible copper plate, the holes in which are slightly smaller than the tubes. This gives a tight flanged connection. The flanges are later given a solder bath, which gives the connection greater security. The plate is of flexible design so as to take care of all expansion and contraction.

The die-pressed headers contain the steam connections and are placed over the ends of the tubes which are locked in position by means of a folded seam construction. They are of semi-cylindrical construction in order to eliminate any possibility of distortion under pressure. A flexible plate underneath takes care of any expansion and contraction.

These heaters are built to withstand a steam or liquid pressure of 50 lb. and any vacuum. They are built throughout of non-corrosive materials, which insure long service under unfavorable shop conditions.

General News Department

The American Association of Passenger Traffic Officers will hold its annual meeting in New York City on Thursday and Friday, October 2 and 3, instead of on Monday and Tuesday of that week.

The Veterans' Association of the Baltimore & Ohio held its fourth annual reunion at Frederick, Md., on May 15. Included in the festivities was a parade in which about 1,500 persons participated.

The Central Railway Club will hold its next meeting at 8 p. m., June 12, at the Hotel Statler, Buffalo. C. C. Richmond, superintendent of stations and transfers, Illinois Central, will give a lecture on freight claim prevention illustrated by motion pictures.

Charles Jones, porter on the private car of the vice-president of the Long Island Railroad, pleading guilty to possessing liquor, was fined \$500 in the United States District Court at New York on May 20. Jones was arrested on April 2, when 14 cases of liquor were found in his car. Later the government attached the car, and libel proceedings against it are now pending.

At Wilkes-Barre, Pa., three Pennsylvania Railroad yard crews, six men each, and two passenger crews, five men each, got their portraits published in the Pennsylvania News by reason of the fact that every man in each of the five crews has bought shares of the railroad company's stock. George H. Everard, assistant trainmaster at Wilkes-Barre, is the leader in a movement to enroll every employee as a stockholder and 71 per cent of the employees in the transportation department at this city are said already to have responded.

At Apex, N. C., on the Seaboard Air Line, 16 miles south of Raleigh, on the afternoon of May 18, in a collision between northbound passenger train No. 44 and a southbound express train, six or more persons, including one passenger, were killed and seven were injured. The southbound train was standing at the outgoing end of the yard waiting for the other train. The reports indicate that an order had been given by the dispatcher for the two trains to meet at Apex but that there was confusion as to which switch was the passing point.

The condition of railroad equipment as reported by the Interstate Commerce Commission for April was: 6,290 locomotives inspected by the Bureau of Locomotive Inspection and 3,078 or 50.5 per cent found defective; and 399 were ordered out of service. The Bureau of Safety inspected 89,131 freight cars, of which 4.7 per cent were found defective, and 1,983 passenger cars, of which 1 per cent were found defective. During the month under review 20 cases involving 45 violations of the safety appliance acts were transmitted to various United States attorneys for prosecution.

The Robinson brothers, employees of the Pennsylvania Railroad, Eastern Region, have been in the service of the company 190 years; that is to say, an average of 38 years each, there being five brothers. President Samuel Rea has written them a letter congratulating the Messrs. Robinson and himself, on being in the service of a company which has such a large number of men who have made the service their permanent business. "No other railroad has so large a number of men among its employees and officers who are making their work a life job; nor indeed is there probably any great business enterprise of any character in which so large a proportion of the employees remain continuously in the service from youth to the retiring age." The Robinson brothers are: W. S., passenger engineer; James K., telegrapher; David A., assistant yardmaster; Milton T., freight conductor and Rathmel R., assistant chief operator. David T. Robinson, the father of these men, was formerly an employee of the signal department.

Annual Meeting of Protective Section, A. R. A.

The Protective Section of the American Railway Association will hold its annual meeting at the Brown Palace Hotel, Denver, Colo., on Wednesday, Thursday and Friday, July 9, 10 and 11. J. C. Caviston, secretary, 30 Vesey street, New York City, will furnish blanks for use of members in securing reduced rates on Pullman sleeping cars.

Correction

In a short news item in the *Railway Age* of April 26, telling of the convention of the Railway Employees' Magazines' Association at St. Louis, Mo., on April 18 and 19, it was incorrectly reported that the convention voted to admit to membership railroad editors of daily newspapers and other publications. This policy was not adopted. It was decided, however, to admit automatically upon application the editor of any magazine published by a Class I railroad, but to have the membership vote on applicants from rapid transit lines and railroads other than Class I. The convention voted to change the name of the organization from "Association" to "Conference," and the officers were designated as chairman, vice-chairman and secretary. The attendance at the convention was 60, representing 23 of the 40 publications whose editors are members of the conference.

Chicago Joint Station Plans

G. A. Harwood, vice-president in charge of improvement and development of the New York Central, has been named chairman of the committee of railroad engineering officers which will prepare plans for the consolidation of the Dearborn street, the Grand Central and the La Salle street stations in Chicago. C. P. Richardson, engineer of track elevation of the Chicago, Rock Island & Pacific, is secretary of the committee. Other members are E. H. Lee, vice-president and chief engineer of the Chicago & Western Indiana; L. C. Fritch, vice-president of the Rock Island; L. G. Curtis, chief engineer of the Baltimore & Ohio Chicago terminal; and G. W. Harris, assistant chief engineer of the Atchison, Topeka & Santa Fe. The committee will study a number of plans for the relocation of tracks so as to permit the straightening of the Chicago river between Polk and 16th streets and bring into one station the roads now using the three terminals.

Freight Container Bureau

Colonel B. W. Dunn, chief engineer of the Freight Container Bureau of the American Railway Association, has issued his annual report for the year ending March 1. The work of the bureau consists of conferences with railroads and shippers and inspections and studies of various kinds of containers with a view to promoting the best practice. During the eleven months ending with February 307 conferences were held with shippers, 326 with transportation companies and over 400 with other interested parties. Over 700 inspections were made of shipping containers, 219 special inspections of cars and a large number of other inspections. Besides this work of the engineers of the bureau, other employees have inspected over 500 cars and have done other work.

The results of the work of the bureau have been made public in the shape of reports on methods of packing eggs, methods of packing furniture, and methods of packing shoes. The present report is supplemented by a special report, filling 35 pages, by Edward Dahill, Jr., on an elaborate survey which he has made of actual practices in connection with the quality of containers in a great variety of different lines of business with comments on the losses due to bad practice.

Since the end of the year reported on, the Bureau has issued circular No. 14, on slack barrels and slack casks and inside packing for pottery.

Freight Operating Statistics of Large Steam Roads—Selected Items for March, 1924

Region, road and year	Average miles of road operated	Train-miles	Locomotive-miles		Car-miles		Ton-miles (thousands)		Average number of locomotives on line daily					
			Principal and helper	Light	Loaded (thousands)	Per cent loaded	Gross, Excluding locomotive and tender	Net, Revenue and non-revenue	Serv-ice-able	Un-serv-ice-able	Per cent unserv-ice-able	Stored		
New England Region:														
Boston & Albany.....	1924	394	287,024	307,632	32,929	5,528	69.2	279,542	110,263	113	30	20.9	...	
	1923	394	349,763	373,380	37,823	6,573	71.4	343,841	149,186	117	26	18.2	...	
Boston & Maine.....	1924	2,455	568,586	632,179	59,091	13,372	72.4	662,112	272,204	328	143	30.4	34	
	1923	2,455	652,226	723,244	66,584	13,224	74.4	681,204	303,427	335	119	26.2	...	
N. Y., New H. & Hart.....	1924	1,974	511,054	540,761	28,449	13,353	71.7	664,289	280,452	307	68	18.2	15	
	1923	1,974	462,166	498,501	37,709	11,136	73.9	562,246	252,005	285	106	27.0	...	
Great Lakes Region:														
Delaware & Hudson.....	1924	887	403,767	564,802	54,296	11,226	65.0	711,020	353,745	254	40	13.6	45	
	1923	886	394,471	564,131	42,819	9,683	67.7	645,268	347,423	239	55	18.6	5	
Del., Lack. & Western.....	1924	993	593,607	713,108	105,404	18,736	69.6	1,013,947	456,092	297	63	17.4	6	
	1923	993	501,516	646,234	112,230	15,156	69.4	868,164	422,133	291	84	22.3	4	
Erie (inc. Chic. & Erie).....	1924	2,325	1,051,536	1,172,638	124,898	36,538	66.0	2,168,733	979,815	636	125	16.4	112	
	1923	2,309	1,225,530	1,426,975	68,705	41,135	69.0	2,446,650	1,137,599	589	176	23.0	...	
Lehigh Valley.....	1924	1,356	649,400	719,506	74,334	19,113	66.0	1,122,601	520,902	476	94	16.5	78	
	1923	1,317	536,066	594,131	66,068	14,875	70.2	889,754	454,436	305	254	45.4	1	
Michigan Central.....	1924	1,827	651,254	675,630	23,679	21,855	65.9	1,135,335	429,193	275	65	19.1	17	
	1923	1,827	663,438	677,151	24,450	22,501	72.9	1,139,454	491,782	317	83	20.8	8	
New York Central.....	1924	6,447	2,350,657	2,643,790	185,415	82,974	62.7	4,908,856	2,108,545	1,160	461	28.4	190	
	1923	6,469	2,729,474	3,143,207	245,585	94,038	65.5	5,638,180	2,650,222	1,238	498	28.7	33	
New York, Chic. & St. L.....	1924	1,669	739,301	748,584	3,755	22,306	67.5	1,205,464	496,612	252	50	16.7	43	
	1923	1,669	767,259	782,805	3,978	20,872	72.8	1,128,572	514,443	220	70	24.2	5	
Pere Marquette.....	1924	2,227	427,151	444,300	9,622	10,640	65.4	597,594	272,373	189	22	10.3	7	
	1923	2,182	401,236	417,182	8,780	10,555	73.9	568,340	286,977	161	40	19.9	...	
Pitts. & Lake Erie.....	1924	231	137,045	141,568	1,448	4,837	59.9	357,369	199,500	64	18	22.1	6	
	1923	231	204,146	210,375	896	6,646	61.0	501,407	286,740	68	14	17.6	...	
Wabash.....	1924	2,459	716,215	740,967	12,152	21,064	70.0	1,125,379	463,763	303	49	13.9	9	
	1923	2,418	618,260	655,183	8,527	19,207	76.5	968,122	417,998	245	92	27.4	...	
Central Eastern Region:														
Baltimore & Ohio.....	1924	5,207	1,990,784	2,293,299	202,489	56,113	66.0	3,408,733	1,667,643	1,032	246	19.2	128	
	1923	5,212	2,323,069	2,676,884	177,419	61,913	67.8	3,706,607	1,858,178	1,052	252	19.3	28	
Central of New Jersey.....	1924	692	298,690	331,518	44,039	7,353	62.3	469,934	228,770	238	41	14.7	35	
	1923	695	323,908	353,347	39,033	7,290	63.4	480,934	245,683	193	77	28.3	...	
Chicago & Eastern Ill.....	1924	945	259,649	260,518	4,373	6,591	62.9	404,881	196,386	120	47	28.1	19	
	1923	945	264,304	270,712	4,971	6,816	65.0	411,778	206,160	111	58	34.3	5	
Cleve., Cin., Chic. & St. L.....	1924	2,376	742,698	782,702	13,961	22,282	62.8	1,398,565	669,032	328	95	22.4	19	
	1923	2,377	759,948	797,105	6,589	24,118	69.0	1,445,284	720,952	306	132	30.2	...	
Elgin, Joliet & Eastern.....	1924	460	133,196	147,535	8,999	4,129	65.8	309,941	165,787	86	14	13.7	3	
	1923	460	163,266	184,097	12,944	5,009	68.4	369,169	202,195	85	15	14.9	...	
Long Island.....	1924	393	50,836	51,978	9,691	716	59.6	42,663	16,669	45	10	17.6	...	
	1923	393	51,909	64,371	10,492	673	59.5	39,661	15,676	43	10	18.4	...	
Pennsylvania System.....	1924	10,937	4,838,163	5,271,314	382,436	132,122	64.4	8,654,062	4,171,146	2,724	746	21.5	101	
	1923	10,876	5,020,710	5,593,349	463,527	136,095	67.7	8,747,407	4,434,037	2,498	833	25.0	...	
Reading.....	1924	1,142	671,813	746,324	80,903	16,998	64.9	1,119,039	582,149	395	78	16.5	90	
	1923	1,142	770,785	871,909	99,858	19,830	67.6	1,311,261	719,576	338	80	19.1	29	
Pocahontas Region:														
Chesapeake & Ohio.....	1924	2,559	1,036,363	1,136,978	28,462	31,144	59.3	2,291,711	1,235,463	433	103	19.3	14	
	1923	2,553	881,629	970,504	19,576	26,461	61.5	2,105,008	1,162,606	413	94	18.6	...	
Norfolk & Western.....	1924	2,231	890,653	1,105,512	42,226	25,673	60.9	1,981,622	1,058,845	564	119	17.4	82	
	1923	2,228	897,537	1,158,429	47,149	24,300	64.6	1,824,482	1,007,473	534	166	23.7	41	
Southern Region:														
Atlantic Coast Line.....	1924	4,865	911,219	919,623	14,018	22,221	62.4	1,177,636	445,701	377	51	12.0	19	
	1923	4,860	897,328	902,349	14,808	21,418	65.6	1,107,165	441,798	315	79	20.1	...	
Central of Georgia.....	1924	1,907	329,946	332,442	6,647	7,463	72.3	389,551	177,669	136	19	12.0	5	
	1923	1,907	331,073	334,455	4,440	7,026	76.4	367,125	178,949	116	16	12.4	...	
I. C. (inc. Y. & M. V.).....	1924	6,196	1,779,602	1,794,845	44,612	49,900	65.1	3,037,665	1,318,189	792	134	14.5	27	
	1923	6,190	2,184,527	2,201,604	46,345	58,911	66.1	3,599,657	1,664,741	753	99	11.6	3	
Louisville & Nashville.....	1924	5,026	1,835,574	1,959,154	74,762	33,340	61.2	2,195,068	1,053,621	621	103	14.2	2	
	1923	5,022	1,707,178	1,837,041	65,404	31,219	66.4	2,044,542	965,823	590	121	17.1	...	
Seaboard Air Line.....	1924	3,548	590,257	603,793	9,790	13,741	67.4	741,016	292,763	231	39	14.3	...	
	1923	3,550	603,111	615,264	9,916	13,269	69.3	697,204	285,094	200	63	23.9	...	
Southern Ry.....	1924	6,820	1,520,596	1,560,406	34,026	35,490	63.9	1,906,350	790,768	863	103	10.7	...	
	1923	6,942	1,710,419	1,762,998	46,702	39,800	72.9	1,995,042	913,407	860	188	17.9	2	
Northwestern Region:														
Chic. & North Western.....	1924	8,463	1,533,810	1,599,335	21,797	33,728	64.6	1,850,926	746,435	872	229	20.8	74	
	1923	8,463	1,808,836	1,877,400	25,310	38,360	66.5	2,157,028	936,874	852	240	22.0	...	
Chic., Milw. & St. P.....	1924	10,983	1,675,727	1,727,127	70,638	42,992	65.1	2,414,247	1,064,089	960	164	14.6	95	
	1923	11,022	1,949,581	2,002,550	80,815	47,949	66.9	2,693,930	1,257,293	852	200	19.0	14	
Chic., St. P., Minn. & Om.....	1924	1,726	332,394	357,374	14,943	6,548	69.0	355,152	151,906	170	34	16.6	2	
	1923	1,726	369,318	393,008	17,487	6,997	72.2	370,228	166,245	156	52	25.1	2	
Great Northern.....	1924	8,252	753,321	783,444	46,232	23,496	69.2	1,299,956	591,100	617	185	23.1	143	
	1923	8,255	1,089,119	1,128,823	57,921	27,926	65.3	1,630,023	754,997	550	223	28.9	11	
M., St. P. & S. Ste. M.....	1924	4,374	551,108	565,425	8,394	12,796	70.7	657,198	297,363	287	56	16.3	15	
	1923	4,352	584,583	599,206	12,379	13,404	76.8	669,448	330,138	286	58	16.9	4	
Northern Pacific.....	1924	6,415	798,448	835,331	46,954	24,343	69.0	1,356,147	611,272	562	165	22.7	89	
	1923	6,415	945,375	991,928	60,866	25,644	65.9	1,488,064	680,091	551	182	24.8	16	
Oreg.-Wash. R. R. & Nav.....	1924	2,179	203,178	213,585	18,372	5,564	75.7	294,253	135,930	141	25	15.0	18	
	1923	2,186	217,485	244,079	33,900	5,567	75.0	297,954	140,055	126				

Compared with March, 1923, for Roads with Annual Operating Revenues above \$25,000,000.

Region, road and year	Average number of freight cars on line daily				Gross tons per train, excluding locomotive and tender	Net tons per train	Net tons per loaded car	Net ton- miles per car-day	Car- miles per car-day	Net ton- miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles including locomotive and tender	Passenger service		
	Home	Foreign	Total	Per cent un- service- able								Stored	Train- miles	Passenger- train car-miles
New England Region:														
Boston & Albany.....1924	1,917	6,016	7,933	3.5	....	974	384	19.9	448	32.5	9,029	204	304,215	1,970,572
.....1923	1,297	9,381	10,678	2.4	....	983	427	22.7	451	27.8	12,217	223	309,849	1,982,408
Boston & Maine.....1924	13,799	17,533	31,332	11.4	....	1,164	479	20.4	280	19.0	3,577	171	827,278	4,319,788
.....1923	11,964	29,574	41,538	9.5	....	1,044	465	22.9	236	13.8	3,987	207	826,136	4,423,464
N. Y., New H. & Hart.....1924	18,909	19,298	38,207	19.0	....	1,300	549	21.0	237	15.7	4,582	158	1,018,099	6,408,883
.....1923	16,106	39,202	55,308	13.1	....	1,217	545	22.6	147	8.8	4,118	224	1,012,216	6,440,987
Great Lakes Region:														
Delaware & Hudson.....1924	9,637	7,962	17,599	5.1	....	1,761	876	31.5	648	31.7	12,858	201	191,937	972,647
.....1923	7,624	11,865	19,489	6.7	....	1,636	381	35.9	575	23.7	12,644	243	194,002	1,000,753
Del., Lack. & Western....1924	14,187	11,224	25,411	4.1	....	1,708	768	24.3	579	34.2	14,823	194	488,388	3,544,287
.....1923	11,407	13,519	24,926	3.6	30	1,731	842	27.9	546	28.3	13,712	241	492,329	3,447,566
Erie (inc. Chic. & Erie).....1924	30,513	21,153	51,666	7.0	3,201	2,062	932	26.8	612	34.6	13,596	146	666,833	5,196,955
.....1923	21,150	39,295	60,445	8.6	....	1,996	969	28.9	634	31.8	16,588	159	594,929	4,190,933
Lehigh Valley .....1924	21,388	11,244	32,632	7.4	....	1,729	802	27.3	515	28.6	12,393	169	344,343	2,643,528
.....1923	17,858	17,131	34,989	6.0	....	1,660	848	30.6	419	19.5	11,132	202	348,193	2,711,791
Michigan Central .....1924	10,607	19,830	30,437	5.2	....	1,743	659	19.6	455	35.1	7,580	137	614,136	5,271,562
.....1923	7,891	24,923	32,814	7.1	....	1,717	741	21.9	483	30.3	8,685	145	583,588	5,138,300
New York Central.....1924	57,441	83,849	141,290	4.9	18,930	2,088	897	25.4	481	30.2	10,550	131	2,552,762	20,499,292
.....1923	53,284	108,628	161,912	9.0	....	2,066	971	28.2	528	28.6	13,217	143	2,579,447	19,606,674
New York, Chic. & St. L..1924	8,422	12,848	21,270	5.2	....	1,631	672	22.3	753	50.1	9,600	137	213,009	1,040,307
.....1923	3,683	17,906	21,589	6.9	....	1,471	670	24.6	769	42.8	9,945	157	217,147	1,061,115
Pere Marquette .....1924	8,205	14,278	22,483	3.6	351	1,399	638	25.6	391	23.3	3,945	147	259,790	1,294,142
.....1923	5,250	20,242	25,492	4.1	....	1,417	715	27.2	363	18.1	4,243	160	265,555	1,244,626
Pitts. & Lake Erie.....1924	10,823	11,680	22,503	3.3	1,874	2,608	1,456	41.2	286	11.6	27,834	78	119,064	598,329
.....1923	8,042	11,759	19,801	20.3	....	2,456	1,405	43.1	467	17.7	40,006	87	116,154	600,422
Wabash .....1924	10,902	12,152	23,054	3.0	406	1,571	648	22.0	649	42.1	6,083	158	505,740	2,832,105
.....1923	7,321	16,043	23,364	2.8	....	1,566	676	21.8	577	34.7	5,577	174	438,108	2,472,053
Central Eastern Region:														
Baltimore & Ohio.....1924	64,158	40,115	104,273	8.0	6,886	1,712	838	29.7	516	26.3	10,332	192	1,563,236	9,921,745
.....1923	46,269	57,418	103,687	9.3	....	1,596	890	30.0	578	28.4	11,501	204	1,482,213	9,320,005
Central of New Jersey....1924	16,364	11,281	27,645	5.2	2,972	1,573	766	31.1	267	13.8	10,664	192	340,426	1,584,089
.....1923	11,575	17,285	28,860	7.2	....	1,485	758	33.7	275	12.8	11,410	203	338,923	1,572,558
Chicago & Eastern Ill....1924	14,479	4,849	19,328	13.7	2,846	1,559	756	29.8	328	17.5	6,703	181	250,258	1,598,100
.....1923	9,805	7,132	16,937	19.2	....	1,558	780	30.2	393	20.0	7,036	207	237,258	1,495,889
Cleve., Cin., Chic. & St. L..1924	13,789	22,562	36,351	5.6	2,788	1,883	901	30.0	594	31.5	9,084	138	722,933	4,473,870
.....1923	9,228	24,709	33,937	6.9	....	1,902	949	29.5	685	33.2	9,786	149	730,036	4,422,956
Elgin, Joliet & Eastern ¹ ..1924	10,304	8,158	18,462	5.7	698	2,327	1,245	40.2	290	11.0	11,633	147	.....	.....
.....1923	8,327	7,523	15,850	8.1	....	2,261	1,238	40.4	412	14.9	14,187	144	.....	.....
Long Island .....1924	1,740	6,541	8,281	0.9	.....	839	328	23.3	65	4.7	1,367	333	201,961	1,147,765
.....1923	1,418	6,240	7,658	3.2	.....	764	302	23.3	66	4.8	1,286	412	193,383	1,085,754
Pennsylvania System .....1924	190,601	109,457	300,058	8.1	30,099	1,789	862	31.6	448	22.1	12,303	158	5,085,649	34,328,350
.....1923	151,034	144,951	295,985	6.3	923	1,742	883	32.6	483	21.9	13,151	166	5,078,190	35,280,890
Reading .....1924	19,431	17,317	36,748	2.9	.....	1,656	867	34.2	511	23.0	16,438	192	513,203	2,416,183
.....1923	14,444	22,039	36,483	3.7	.....	1,701	934	36.3	636	25.9	20,319	194	510,741	2,347,723
Pocahontas Region:														
Chesapeake & Ohio.....1924	27,627	12,936	40,563	4.9	2,519	2,211	1,192	39.7	983	41.7	15,575	136	467,570	2,635,775
.....1923	30,000	16,452	46,452	11.8	.....	2,388	1,319	43.9	807	29.9	14,691	131	452,370	2,592,256
Norfolk & Western.....1924	25,395	11,922	37,317	3.3	1,200	2,225	1,189	41.2	915	36.4	15,311	195	412,841	2,635,147
.....1923	24,527	11,987	36,514	4.9	.....	2,033	1,122	41.5	890	33.2	14,588	205	396,262	2,404,200
Southern Region:														
Atlantic Coast Line.....1924	20,444	16,997	37,441	3.6	....	1,292	489	20.1	384	30.7	2,955	138	984,104	7,378,404
.....1923	13,950	20,637	34,587	8.7	....	1,234	492	20.6	412	30.4	2,932	147	935,311	7,206,818
Central of Georgia.....1924	3,924	6,608	10,532	5.3	....	1,181	539	23.8	544	31.6	3,006	169	360,857	2,193,481
.....1923	1,874	7,149	9,023	5.5	....	1,109	541	25.5	640	32.9	3,027	184	355,492	2,000,992
I. C. (inc. Y. & M. V.)...1924	41,661	22,972	64,633	4.3	3,700	1,707	741	26.4	658	38.3	6,863	149	1,612,080	9,706,251
.....1923	25,607	42,430	68,037	6.2	.....	1,648	762	28.3	789	42.3	8,675	165	1,538,838	9,280,053
Louisville & Nashville....1924	37,417	22,105	59,522	5.5	105	1,196	574	31.6	571	29.5	6,763	186	1,047,649	6,379,882
.....1923	23,596	25,701	49,297	11.4	49	1,139	566	30.9	632	30.8	6,204	199	1,020,741	6,106,039
Seaboard Air Line.....1924	8,755	11,668	20,423	5.8	....	1,255	496	21.3	462	32.2	2,662	160	689,259	4,648,671
.....1923	9,720	15,191	24,911	19.6	....	1,156	473	21.5	369	24.8	2,590	179	672,978	4,430,749
Southern Ry.....1924	34,379	27,937	62,316	4.5	.....	1,254	520	22.3	409	26.7	3,746	190	1,337,681	8,259,007
.....1923	26,614	36,556	63,170	8.1	....	1,166	534	24.0	466	26.7	4,244	215	1,342,968	7,875,084
Northwestern Region:														
Chic. & North Western....1924	44,022	31,410	75,432	7.2	1,500	1,203	485	22.1	319	22.3	2,845	177	1,585,255	9,732,411
.....1923	32,530	47,526	80,056	6.9	4,246	1,192	518	24.4	378	23.2	3,571	205	1,548,714	9,458,910
Chic., Milw. & St. P.....1924	49,595	27,220	76,815	6.5	4,000	1,441	635	24.8	447	27.7	3,125	175	1,475,413	8,580,228
.....1923	36,339	45,940	82,279	7.5	.....	1,388	648	26.2	493	28.1	3,680	188	1,475,294	8,828,033
Chic., St. P., Minn. & Om..1924	3,363	10,347	13,710	8.5	726	1,068	457	23.2	357	22.3	2,839	168	306,781	1,735,584
.....1923	1,997	10,308	12,305	10.3	110	1,002	450	23.8	436	25.4	3,107	202	296,014	1,699,490
Great Northern .....1924	43,443	8,341	51,784	5.9	....	1,726	785	25.2	368	21.2	2,311	161	967,995	5,644,795
.....1923	37,015	13,581	50,596	8.0	....	1,497	693	27.0	481	27.3	2,950	191	987,864	5,739,804
M., St. P. & S. Ste. M....1924	17,957	8,449	26,406	4.7	355	1,193	540	23.2	36					

Annual Meeting of Freight Station Section

The Freight Station Section of the American Railway Association held its annual meeting at Charleston, S. C., on May 13, 14 and 15, headquarters being at the Francis Marion and the Fort Sumter hotels.

The development of ocean transportation was one of the prominent topics discussed at the meeting and the members listened to addresses by Dr. R. S. MacElwee; W. S. Hill, member of the United States Shipping Board, and Admiral William S. Benson. Prominent railroad officers present were William H. Gatchell, and M. J. Conley of the Southern, and W. N. Mitchell of the Baltimore & Ohio. Others present were L. M. Betts, Lewis Pilcher, Fred Winburn and J. Marshall representing different departments of the American Railway Association.

The election of officers resulted in the choice of the following: Chairman E. J. Coffey, Southern Railway, East St. Louis, Ill.; First Vice-Chairman C. T. Speer, C., St. P., M. & O., St. Paul,

Minn.; Second Vice-Chairman E. E. Lamberton, Southern Pacific Steamship Lines, New Orleans, La. The Committee of Direction consists of F. T. Anderson, L. J. Brinkman, J. A. Byron, W. H. George, G. B. Ingersoll, Frank Laughlin and W. Merriman.

Between sessions, the members made excursions to Fort Sumter and Fort Moultrie, and other points of interest.

Excess Income Payments

The Interstate Commerce Commission's recapture fund, representing the amounts paid by railroads as one-half of their net railway operating income in excess of 6 per cent preliminarily computed on their own statement of the value of their property, up to May 9 amounted to \$3,655,559, according to a statement furnished by the commission to the Senate and House committees on interstate commerce in connection with their hearings on section 15a. This amount had been paid by 43 carriers, most of them short lines and railroads of the character of industrial railroads.

OPERATING REVENUES AND OPERATING EXPENSES OF CLASS I STEAM ROADS IN THE UNITED STATES (For 193 Steam Roads, Including 15 Switching and Terminal Companies)

Item	United States		Eastern District		Pocahontas Region		Southern Region		Western District	
	1924	1923	1924	1923	1924	1923	1924	1923	1924	1923
Average No. of miles operated	235,917.27	235,907.92	59,438.81	59,246.14						
Revenues:										
Freight	\$371,643,606	\$398,760,419	\$173,957,913	\$190,348,030	5,461.46	5,448.92	38,335.22	38,434.06	132,681.78	132,678.80
Passenger	87,148,239	88,252,086	40,494,824	41,175,072	17,154.250	15,761.735	\$52,525.164	\$55,585.705	\$128,006.279	\$137,064.949
Mail	8,134,303	7,884,035	3,206,077	3,067,104	2,070.442	2,134.662	13,067.952	12,779.913	31,515.021	32,162.439
Express	12,311,043	14,338,568	5,551,798	7,002,856	203.044	186.302	1,155.445	1,098.662	3,569.737	3,531.967
All other transportation	15,983,263	16,108,831	9,288,614	9,371,265	281.804	343.450	1,852.653	1,649.669	4,624.788	5,342.593
Incidental	9,348,121	9,920,438	4,750,757	5,333,554	162.195	174.956	961.242	960.551	5,571.212	5,602.059
Joint facility—Cr.	775,953	845,179	349,785	409,600	346.328	382.361	1,249.607	1,245.668	3,001.429	2,958.855
Joint facility—Dr.	219,607	283,166	127,063	175,018	14.608	12.619	113.633	129.000	297.927	293.960
Railway operating revenues	508,124,921	535,826,390	237,472,705	256,532,463	20,229.604	18,994.042	70,893.078	73,418.892	176,529.534	186,880.993
Expenses:										
Maintenance of way and structures	59,458,970	57,225,907	24,530,762	23,493,376	2,883.936	2,209.455	9,135.960	8,895.995	22,908.312	22,627.081
Maintenance of equipment	113,292,835	126,248,629	55,712,368	63,228,490	5,063.720	4,658.450	13,765.846	14,803.656	38,750.901	43,558.033
Traffic	8,053,079	7,684,360	3,059,059	2,887,143	202.623	185.107	1,457.424	1,456.977	3,333.973	3,155.133
Transportation	192,039,445	209,893,318	93,524,202	102,854,860	6,550.329	6,506.620	25,531.596	27,108.244	66,433.318	73,423.594
Miscellaneous operations	3,982,681	4,063,789	1,932,910	2,008,177	87.654	85.573	469.264	440.501	1,492.853	1,529.538
General	14,315,862	13,635,791	6,385,454	6,085,733	462.086	417.961	1,846.866	1,788.985	5,621.456	5,343.112
Transportation for investment—Cr.	868,963	824,806	144,840	53,640	25.470	5.194	152.176	120.640	546.477	645.332
Railway operating expenses	390,273,909	417,926,988	184,999,915	200,504,139	15,224.878	14,057.972	52,054.780	54,373.718	137,994.336	148,991.159
Net revenue from railway operations	114,851,012	117,899,402	52,472,790	56,028,324	5,004.726	4,936.070	18,838.298	19,045.174	38,535.198	37,889.834
Railway tax accruals	27,218,221	26,718,153	11,258,672	10,893,888	1,150.504	945.142	3,592.876	3,491.050	11,216.169	11,388.073
Uncollectible railway revenues	163,821	148,740	68,704	53,643	3.280	1,924	15.100	17.363	76.737	75.810
Railway operating income	87,468,970	91,032,509	41,145,414	45,080,793	3,850.942	3,989.004	15,230.322	15,536.761	27,242.292	26,425.951
Equipment rents—Dr. balance	5,746,640	5,185,506	3,816,168	3,993,657	d391,610	d525,611	649,573	976,695	1,672,509	740,765
Joint facility rent—Dr. balance	1,482,446	1,722,692	601,691	871,884	83,123	97,814	102,803	34,171	694,829	718,823
Net railway operating income	80,239,884	84,124,311	36,727,555	40,215,252	4,159.429	4,416.801	14,477.946	14,525.895	24,874.954	24,966.363
Ratio of expenses to revenues (per cent)	77.26	78.00	77.90	78.16	75.26	74.01	73.43	74.06	78.17	79.73
For Three Months Ended With March, 1924 and 1923										
Average No. of miles operated	235,905.01	235,890.93	59,439.45	59,347.51	5,457.50	5,448.19	38,333.49	38,435.49	132,674.57	132,659.74
Revenues:										
Freight	\$1,057,655,289	\$1,092,645,282	\$487,996,079	\$510,087,396	\$48,302.530	\$43,018.536	\$149,331.822	\$152,629.051	\$372,024.858	\$386,910.299
Passenger	262,237,777	258,511,858	121,306,908	120,514,335	6,030.012	6,028.294	40,520.176	38,797.200	94,380.681	93,172.029
Mail	23,782,136	22,655,666	9,156,265	8,547,158	587.618	510.902	3,381.049	3,190.979	10,657.204	10,406.627
Express	34,013,185	35,086,305	15,192,003	17,636,028	751.141	876.106	4,804.518	3,815.773	13,265.523	12,758.398
All other transportation	45,348,170	45,376,234	26,036,847	26,417,400	456.506	477.233	2,692.616	2,679.440	16,162.201	15,802.161
Incidental	27,718,810	29,254,154	14,127,204	16,061,588	990.991	971.898	3,516.656	3,399.924	9,083.959	8,820.744
Joint facility—Cr.	2,890,033	2,492,960	1,063,866	1,143,056	44.634	38.137	381.445	409.966	1,400.088	901.801
Joint facility—Dr.	641,867	693,095	326,014	372,529	6.783	9.286	95.323	90.862	213.747	220.418
Railway operating revenues	1,453,003,533	1,485,329,364	674,553,158	700,034,432	57,156.649	51,911.820	204,532.959	204,831.471	516,760.767	528,551.641
Expenses:										
Maintenance of way and structures	169,143,996	158,533,414	71,216,570	66,413,669	7,705.039	6,003.298	26,277.013	25,205.771	63,945.374	60,910.676
Maintenance of equipment	330,590,384	361,393,098	161,545,186	179,975,645	14,523.024	13,721.517	40,579.754	41,886.898	113,942.420	125,808.638
Traffic	24,067,306	22,532,829	9,073,715	8,359,383	600.482	560.003	4,445.283	4,268.429	9,947.826	9,345.014
Transportation	574,403,348	610,450,304	276,454,478	299,382,340	19,356.949	18,840.729	75,876.903	77,369.486	202,715.018	214,857.749
Miscellaneous operations	12,097,957	11,920,800	5,889,724	6,002,742	253.290	242.951	1,359.604	1,229.604	4,595.339	4,445.503
General	42,382,057	39,878,581	18,879,646	17,673,756	1,275.692	1,176.618	5,494.355	5,191.953	16,732.364	15,836.854
Transportation for investment—Cr.	2,749,882	1,835,195	380,356	146,764	57.181	26.486	367.113	324.090	1,945.232	1,337.855
Railway operating expenses	1,149,935,166	1,202,873,831	542,678,963	577,660,771	43,657.295	40,518.430	153,665.799	154,828.051	409,933.109	429,866.579
Net revenue from railway operations	303,068,367	282,455,533	131,874,195	122,373,661	13,499.354	11,393.390	50,867.160	50,003.420	106,827.658	98,685.062
Railway tax accruals	78,766,074	76,615,969	31,475,291	29,871,690	3,455.341	2,810.131	10,285.352	9,904.654	33,550.090	34,029.494
Uncollectible railway revenues	533,507	410,009	215,093	188,444	6.824	12.943	43.566	36.048	268.024	175.324
Railway operating income	223,768,786	205,429,555	100,183,811	92,313,527	10,037.189	8,570.766	40,538.242	40,062.718	73,009.544	64,482.544
Equipment rents—Dr. balance	16,417,459	16,087,256	10,616,701	12,390,701	d1,109.885	d1,440.100	1,580.246	2,467.156	5,330.397	2,669.499
Joint facility rent—Dr. balance	4,575,280	4,738,925	1,981,001	2,334,071	310.339	263.596	314.597	153.330	1,969.343	1,987.928
Net railway operating income	202,776,047	184,603,374	87,586,109	77,588,755	10,836.735	9,747.270	38,643.399	37,442.232	65,709.804	59,825.117
Ratio of expenses to revenues (per cent)	79.14	80.98	80.45	82.52	76.38	78.05	75.13	75.59	79.33	81.33

a Includes \$3,011,757 sleeping and parlor car surcharge. b Includes \$2,949,741 sleeping and parlor car surcharge. c Includes \$8,379,397 sleeping and parlor car surcharge. d Deficit or other reverse items. Compiled by Bureau of Statistics, Interstate Commerce Commission. (Subject to revision.)

Only three Class I railroads were included, the Duluth, Missabe & Northern, which had paid \$2,851,000; the Elgin, Joliet & Eastern, which had paid \$55,000, and the Richmond, Fredericksburg & Potomac, which had paid \$169,343 for the year 1922. The only other railroad whose payment amounted to as much as \$100,000 was the Ironton, which paid \$156,301. Of the total \$2,383,007 was for 1923, \$486,413 was for 1922, \$47,371 was for 1921 and \$738,766 was for the applicable period of 1920.

The commission has recently ordered hearings on the reports filed by a number of railroads and had ordered one in the case of the Duluth, Missabe & Northern which had filed reports indicating no excess, but the carrier has since made a payment and the hearing was not held.

An Attentive Audience

Here is a picture of a Safety First lecture that really gets across; the faces of the listeners prove it. Virginia Sylvester, Rosie Rief, Elsie Rief, Evelyn Knapp, Lloyd Miller and Billy Jenkins, all embryo citizens of Williamsport, Pa., are being warned of crossing dangers by James Mullen, otherwise known as Dad Mullen, a Pennsylvania Railroad crossing attendant of that city. Mr. Mul-



len's crossing is near Dickinson seminary, and it is not to children alone that he discourses on the proper conduct of pedestrians and drivers at crossings. The students of the seminary, as well as most of the other people in the region, depend upon him for any and all kinds of railroad information. Evidently he finds in his job all necessary "human interest," on the pleasanter side, to counteract the annoyances which reckless automobilists invent in their attempt to make his life a burden.

Conservatives Unsuccessfully Oppose

Canadian National Branch Line Bills

With the final disposal of all the 26 Canadian National branch line bills by the House of Commons Committee on Railways, Canals and Telegraph Lines the measures were introduced in the House last Friday night for third reading and passage. Here again they met with vigorous opposition from the Conservatives. The moment the first bill was introduced Sir Henry Drayton moved that the amount guaranteed for construction be first included in estimates and voted by Parliament, as expressly for that purpose. This course was opposed by George P. Grahm, Minister of Railways and Canals, and by Charles Stewart, Minister of the Interior, who argued that the identical effect would be secured by the passage of the bill in question. After considerable debate, mostly a reiteration of argument before the committee, the amendment was defeated on a standing vote, and the bill was reported and given third reading. Then Sir Henry moved the same amendment to each of the succeeding bills, and each time the amendment was defeated by a united vote of Liberals and Progressives. Third reading was given to the following 12 branch line bills: Grand Fresnière-Rinfret, Kamloops-Kelowna, Peebles, Gravelbourg, Ste. Rose du Lac, Turtleford, Kelvington, Paddockwood, Eyre, Eston, St. Paul, and Rosedale.

In the House Committee on Thursday the following amendment was adopted to be included in all the bills, and it was adopted with practically no discussion: "Should it appear to the company upon making final surveys of the said line of railway that the

expenditure involved in the completion thereof will exceed the limits of expenditure specified in this act, the company shall not commence nor proceed with the work upon the said line of railway without first obtaining the approval of Parliament."

Canadian Railways Claim Toronto Viaduct

Agreement Not a Court Case

Almost identical defenses have been filed by the Canadian Pacific and the Canadian National to the claim of the Toronto Harbor Commission for specific performance of the viaduct agreement entered into between that city and the railways in 1913. Both companies object that the courts have no jurisdiction and that the Dominion Board of Railway Commissioners is the final abiter. This is the main defense of the railways to the action in which the Harbor Commissioners claim \$5,000,000 damages for delay in carrying out the agreement or \$10,000,000 damages for failure to construct the viaduct. Execution of the agreement on July 29, 1913, is admitted in the defense of the Canadian National, which adds that the contemplated work was not proceeded with on account of the war. It is alleged that all parties interested concurred in the non-prosecution of the work during the war and for some time thereafter. No decision, it is said, has been given by the Dominion Railway Board on the application to that body in April and May, 1921, for an order extending the time for completion of the work. Pending decision by that Board, it is contended, there is no duty cast upon any parties to carry out the agreement and, consequently, no right of action exists in the Harbor Board to compel the carrying out of any of the terms of the agreement or to recover damages for failure to proceed therewith.

Freight Claim Prevention Congress at Chicago

A freight claim prevention congress will be held under the auspices of the Chicago Claim Conference at the Hotel Sherman, Chicago, on June 4 and 5. The Freight Claim division of the American Railway Association will be represented by its general committee and the Committee on Freight Claim Prevention. Addresses will be made by R. H. Aishton, president of the American Railway Association; J. E. Gorman, president of the Chicago, Rock Island & Pacific, and George A. Blair, traffic manager of Wilson & Co., Chicago. Methods of conducting freight claim prevention activities will be presented by G. W. Lupton, assistant to the vice-president, A. T. & S. F., and J. H. Hustis, Jr., superintendent of property protection, N. Y. C., with a general discussion of method (a) on individual lines, (b) nationally, (c) with the shipping public. Carload damages will be presented by W. F. Thiehoff, general manager, C. B. & Q. J. J. Pelley, general manager of the Illinois Central, will speak on damage to fresh fruits and vegetables; F. H. Hammill, assistant general manager C. & N. W., will speak on l. c. l. loss and damage, and W. J. Womer, of the Consumers Company, Chicago, on the basis of measure of damages; that is, origin or destination value. J. A. Brough, of the Crane Company, Chicago, will speak on the reimbursement of shippers or consignees for expense incurred in disposing of damaged goods. Concealed loss will be presented by S. T. Heffner, of the J. V. Farwell Company, Chicago. C. T. Bradford, of the International Harvester Company, will speak on freight charges on damaged articles returned to shipper, and H. R. Park, of the Chicago Livestock Exchange, on the expedition of the adjustment of claims.

Mechanical Division Program

Division V—Mechanical, American Railway Association, will hold its annual meeting at Atlantic City, N. J., from June 11 to 18, inclusive. The sessions will be held in the Greek Temple on the Million Dollar Pier and will extend from 9:30 a. m. to 12:30 p. m., daylight saving time, except on Saturday, June 14, which will be available for the examination of exhibits. No sessions will, of course, be held on Sunday, June 15.

On Wednesday, June 11, in addition to routine matters, there will be the annual address by the chairman of the Division, John Purcell, assistant to the vice-president of the Atchison, Topeka & Santa Fe; an address by President R. H. Aishton of the American Railway Association; and reports of the General Committee, the Committee on Nominations and the Committee on Locomotive Design and Construction.

On Thursday, June 12, there will be a discussion of the report

on Shop and Engine Terminals and the following individual papers: The Modern Locomotive, by W. H. Winterrowd, assistant to president, Lima Locomotive Works; the Lehigh Valley Three-Cylinder Locomotive No. 5000, by J. G. Blunt, American Locomotive Company; the Relation of Track Stresses to Locomotive Design, by C. T. Ripley, chief mechanical engineer, A. T. & S. F.

On Friday, June 13, the reports on Locomotive and Car Lighting and Electric Rolling Stock will be discussed. An individual paper on Development of the Electric Locomotive, by F. H. Shepard, director of heavy traction, Westinghouse Electric & Manufacturing Company, will also be presented.

On Monday, June 16, Frank McManamy, of the Interstate Commerce Commission, will make an address and the following individual papers will be presented: Governmental Relations to Transportation, by W. R. Cole, president, Nashville, Chattanooga & St. Louis; Proper Training of Shop Supervisory Forces, by L. W. Baldwin, president, Missouri Pacific. There will also be discussions of the reports on Specifications and Tests for Materials and on Car Construction and the annual election of officers.

On Tuesday, June 17, there will be a discussion of the following reports: Prices for Labor and Material, Arbitration, Tank Cars, Loading Rules and Safety Appliances.

On Wednesday, June 18, the last day of the convention, the following reports will be discussed: Autogenous and Electric Welding, Brakes and Brake Equipment, and Wheels.

Some time during the sessions of the convention an address will be made by W. R. Scott, president of the Southern Pacific, Texas and Louisiana Lines.

Twenty-four "Reminders"

Twenty-four reminders of rules that must be complied with in the handling of freight at stations, both carload and less than carload, constitute the main feature of a circular, referred to in the editorial column, which has been issued by Charles H. Allen, assistant to the general manager, in charge of "Freight Claim Prevention" on the Grand Trunk Lines west of Detroit.

These reminders tell of a number of deficiencies in the service, as discovered by inspectors; and also contain numerous educational paragraphs of a constructive nature. Among the "must not's" are:

Agents must not accept the return of freight that has been delivered to consignee, except on orders from the freight claim agent.

Agents are continuing to accept freight for towns off the line without the name of the railroad station being shown.

The condition of lading on open top cars must be inspected when received from another road; "This is not being done."

"Despite all instructions" an agent recently allowed beans to be loaded in a car having an oily floor.

Conductors handling freight at blind sidings must invariably check the same. . . . "Once in a while" one fails, and that always turns out to be the shipment on which a claim is made.

Some agents are not complying with rules to use a carbon between freight bill and delivery receipt, when making notations on the freight bill.

Not all of the paragraphs, by any means, are prohibitions. Among the pleasanter items is one warmly commending the doings of staff meetings which have been held at Flint and at Pontiac. "Every large station should hold a meeting at least once a month." Agents should read the minutes of such meetings; and keep the information on file where it can be quickly referred to. Each recipient of this circular is invited to present any constructive criticisms occurring to him. "In dealing with our patrons we should always remember that the public is not short of intelligence but is chronically short of facts."

The introduction to the 24 reminders draws attention to the decided reduction in the amounts paid for freight damages during the past year, and calls for energetic action to accomplish still further improvement. Figures are given showing the amounts paid on each of different classes of commodities, as, for example, clothing, fresh fruits, automobiles, etc. Some agents, in reporting on claims, have omitted a part of the facts. This is supposed to be due to an excess of zeal to hold the traffic, but they are told that this is not necessary to retain desirable business. "Service is what gets the business, but courtesy is the handmaid of service." With courtesy it is possible to settle claims and retain the friendship of patrons and at the same time remain true to the company.

Traffic News

The Ohio Valley Shippers' Regional Advisory Board will hold its third regular meeting at the Miami Hotel, Dayton, Ohio, on Tuesday, May 27, beginning at 10 a. m.

The Chicago, Peoria & St. Louis on May 12 filed an application with the Illinois Commerce Commission requesting permission to discontinue the operation of passenger trains on Sunday.

The Southern Pacific of Mexico has completed arrangements with the National Railways of Mexico whereby passenger and freight service will be inaugurated within a month between Guadalajara and La Quemada.

The Missouri Pacific during the first 15 days of May operated 97.6 per cent of its passenger trains on time. Five of the 18 divisions which operated 497 trains reported every train arriving at its destination on time.

The Denver & Rio Grande Western has chosen the name "Panoramic Special" for its daylight train between Denver, Colo., and Salt Lake City, Utah, this name being selected from the suggestions received in a contest in which a \$50 prize was offered.

The Committee on Freight Claim Prevention of the American Railway Association will conduct its perishable freight campaign during the months of July and August, instead of June, July and August, in order that there may be no conflict with the strapping campaign to be conducted during the month of June.

The Chicago, Rock Island & Pacific placed in service on May 18 a new train, known as the Colorado Flyer, from St. Louis, Mo., to Denver, Colo., and Colorado Springs, by way of Kansas City. The new train leaves St. Louis at 9 a. m. and arrives at Kansas City at 5:30 p. m., and at Denver at 1 p. m. the next day.

George A. Leithner has been appointed district manager of the Car Service Division of the American Railway Association with headquarters at San Francisco, Cal., the appointment to take effect on June 1. Mr. Leithner's territory will include parts of Oregon, all of California and Nevada, and parts of Arizona and New Mexico heretofore assigned to the district manager at Dallas, Tex.

The Midwest Regional Advisory Board held its second meeting at the Great Northern Hotel, Chicago, on May 21. The time was mostly taken up in the completion of the organization and in hearing the reports of the committees. C. H. Markham, president of the Illinois Central, addressed the meeting, endorsing the views of the traffic men and the statements which they had made to the shippers, and emphasizing the importance of the efficient use of freight cars at the present time, in view of the increasing cost of cars. Mr. Markham also discussed the Gooding bill, now before Congress.

The Chicago & North Western established a record of 100 per cent on time for many important passenger trains operated on the system during April. This includes the San Francisco Overland Limited and the Los Angeles Limited, the Omaha-Sioux City and Chicago Special between Chicago and the Missouri river, and trains between Chicago and Des Moines. A similar record was maintained on all important trains operated between Chicago and the Twin Cities and points in Minnesota and South Dakota, and also between Chicago and Green Bay, Wis. All express trains between Chicago and Milwaukee were on time for the entire month.

As a result of reduced summer rates from California to eastern points which became effective on May 22, the railroads have had a heavy "back-east" movement. On that day the Golden State Limited, which operates over the Southern Pacific, the El Paso & Southwestern and the Chicago, Rock Island & Pacific from Los Angeles to Chicago, was made up in nine sections. The Overland Limited, which moves over the Southern Pacific, the Union Pacific, and the Chicago & North Western from San Francisco to Chicago, had three sections, while the Atchison, Topeka &

Santa Fe handled eight sections of the California Limited, three sections of the Navajo and two sections of the Missionary in addition to two other regular trains.

The Great Northern on June 1 is to conduct a party of 20 representatives of eastern newspapers on a nine-day trip from Chicago to Seattle, Wash., starting on the first of the new Oriental Limited trains which will be put into service on that date. It is desired that the guests obtain first-hand information from civic bodies and other official sources concerning the agricultural, industrial and economic conditions of the northwest. Representatives of the civic organizations of Minnesota, North Dakota, Montana, Washington and Oregon, will be expected to meet the newspaper men at the principal cities through which the train passes on its journey to the coast.

An open forum meeting of the Traffic Club of Chicago was held at Chicago in conjunction with the Chicago Shippers' Conference Association on May 12, at which W. A. Colston, vice-president of the New York, Chicago & St. Louis, led the discussion on railroad consolidation. He spoke strongly in opposition to compulsory consolidation; such a law would probably be the first step toward government ownership. E. T. Whiter, vice-president of the Pennsylvania, spoke on the Howell-Barkley bill calling for the abolition of the Labor Board, describing the bill as pernicious legislation. He urged all present to write their congressmen protesting the bill. Others who spoke at the meeting were C. H. Markham, president of the Illinois Central, J. H. Beek, secretary of the National Industrial Traffic League, F. P. Bentley, traffic manager of the Illinois Steel Company, and George Blair, traffic manager of Wilson & Company and president of the Traffic Club of Chicago.

By an order of the Board of Railway Commissioners of Canada issued last week the railway companies of Canada have been directed to reduce the flour rates from Ontario points to Montreal, Quebec and Atlantic seaboard ports such as Baltimore, Philadelphia, New York, Portland, Boston, St. John and Halifax. Under the order the rates from Collingwood, Depot Harbor, Goderich, Midland, Port Colborne, Port McNicoll, and Tiffin, Ont., to Montreal will be 17½ cents, instead of the present rate of 18 cents, and to St. John, West St. John, Halifax, Portland and Boston the rate will be 18½ cents instead of the present rate of 19½ cents. These rates will also apply on ex-lake grain milled in transit at other Ontario stations and include the stop-off charge of one cent. From the above points to Baltimore, Philadelphia and New York the rates will vary from 24½ cents at Depot Harbor to 18½ cents at Port Colborne. These rates, plus the stop-off charge of one cent, will also apply on ex-lake grain milled in transit at other stations within Canada.

Old Train Compared with Modern

The Great Northern and the Chicago, Burlington & Quincy recently exhibited at Chicago a train of 60 years ago with a modern all-steel passenger train. The old train consists of the William Crooks engine, the first locomotive used on the Great Northern, an antiquated combination coach and the original Pullman sleeper, No. 9, which first went into service in 1859. The modern train is one of the new Oriental Limited trains which will be placed in service between Chicago and the Pacific coast on June 1. These trains will proceed under their own steam over the Chicago, Burlington & Quincy to the Twin Cities, where they also will be shown in the Union Station in St. Paul, Minn., for two days and for two days in the Great Northern station in Minneapolis. They will then proceed to the Pacific Northwest, stopping one day each in Fargo, N. Dak., Grand Forks, Spokane, Wash., Seattle and Portland, Ore. The old train will carry all its antiquated equipment, with the exception of the old link couplers. The Interstate Commerce Commission, in sanctioning the exhibition of these trains, stipulated that automatic couplers must be placed on the old equipment to conform to the law.

ATTORNEY GENERAL CRABBE, of Ohio, May 16, ruled that companies operating newsstands and selling cigarettes at railroad stations may not sell cigarettes on trains while they are in the stations. If such a company operates one stand inside the station and another on the platform, cigarette licenses must be obtained for each stand.

Commission and Court News

Interstate Commerce Commission

The Interstate Commerce Commission has issued a modification of its order in the 1922 express rate case to provide that carriers shall not charge for the interstate transportation of fruits, vegetables, berries, butter, or eggs, in carloads, by express, commodity rates exceeding those in effect on October 12, 1920.

New England Mail Pay Case Reopened

The Interstate Commerce Commission has reopened the railway mail pay case on petition filed by the Bangor & Aroostook, Boston & Albany, Boston & Maine, Central New England, Central Vermont, Maine Central, New York, New Haven & Hartford, and Rutland, for a re-argument upon that portion of the report and order entered on December 13, 1923, which denied the carriers' request for a finding as to rates of pay for the transportation of mail matter from the date their application was filed, namely, February 25, 1921, to December 13, 1923.

Personnel of Commissions

Otto Bock, former deputy United States district attorney, has been appointed a member of the Colorado Public Utilities Commission to complete the unexpired term of Judge Cully Scott.

State Commissions

The Massachusetts Department of Public Utilities, responding to a communication from the Legislature, has rendered an opinion disapproving the proposal, which has been under discussion in the Legislature, to require the railroads to sell commutation tickets good for 35 days at the prices now prescribed for a monthly ticket, which is good for 60 rides.

The Public Utilities Commission of Connecticut has decided in favor of the railroads in a complaint made against a general advance in commutation fares which went into effect on February 18, last. By withdrawing certain forms of tickets, the cost of daily rides in some cases was much increased. The commission finds that both on the New York, New Haven & Hartford and on the Central New England the new rates are not higher than is just and reasonable and are not discriminatory. The petitioners asked that the ratio between single trip fares and the commutation fares existing on July 1, 1865, should be adhered to at the present time, but the commission finds that the ratio existing 59 years ago cannot be determined.

Court News

Assumption of Risk by Employee—Utah

The Utah Supreme Court holds that a trackman who lost the sight of an eye struck by a steel chip from a chisel held by a fellow workman in cutting a rail could not recover under the federal Employers' Liability Act where he knew of the worn and defective condition of the chisel, since he assumed the risk as matter of law.—Guitron v. Oregon Short Line (Utah) 217 Pac. 971.

Boiler Safety Act—Handholds Must Be

Fastened with Bolts or Rivets

In an action for injury to a switchman it appeared that while stepping from the footboard of a tender while the engine was in motion his glove caught in a cotter pin used to fasten the handhold and he was thrown down and dragged. The Circuit Court of Appeals, Fifth Circuit, holds that sections 2 and 5 of the Boiler Safety Act are extended by the amendment of 1915 to tenders, that the Interstate Commerce Commission's rule requiring handholds on switching locomotives to be securely fastened with bolts or

rivets is valid, and that the substitution of a cotter pin was such a failure to comply with the act as to render the defendant liable, regardless of its negligence.—F. W. & D. C. v. Jones, 294 Fed. 858.

United States Supreme Court

Ticket Limiting the Selling Carrier's

Liability Prima Facie Valid

In an action in the Arkansas state courts against the Missouri Pacific, it appeared that the plaintiff bought a round-trip ticket in Forrest City, Ark., over its line to Texarkana, the Texas & Pacific to Longview, Tex., and the I. & G. N. to Houston; returning via the same route. Claiming that while on the line of the last-named company she was assaulted by the auditor, she instituted an action to recover damages from the selling carrier to the circuit court for St. Francis County, Ark.

The ticket stipulated that "the selling carrier acts only as agent and is not responsible beyond its own lines."

The ticket was purchased by order over the telephone. When plaintiff reached the station she paid the purchase price and was handed the ticket in an envelope. She did not sign or inspect it.

The trial court denied a peremptory instruction in favor of the Missouri Pacific, and the case was sent to the jury on the theory that the assault constituted a breach of the initial carrier's contract for safe transportation. Judgment went in favor of the plaintiff for both compensatory and punitive damages, and was affirmed as to the former by the higher court; but the Supreme Court of the United States, on an application for a writ of certiorari, holds that this was error. "An interstate carrier is entitled to the presumption that its business is being conducted lawfully. Acceptance and use of the ticket sufficed to establish an agreement, *prima facie* valid, which limited the selling carrier's liability. Mere failure of the passenger to read matter plainly placed before her cannot overcome the presumption of assent. N. Y. C. v. Beaham, 242 U. S. 148, 151; G. H. & S. A. v. Woodbury, 254 U. S. 357, 360." M. P. v. Prude. Opinion by Justice McReynolds. Decided May 12, 1924.

Garnishment to Change Jurisdiction Held Void

A citizen and resident of Colorado, employed by the Atchison, Topeka & Santa Fé, was injured while performing his duties in New Mexico. He sued the company for damages in a state court of Texas, but, not being able to make personal service on it within that state, procured from the same court a writ of garnishment to a Texas railroad company whose line connected with the Santa Fé, which had in its possession Santa Fé cars, and which owed it large sums on traffic balances. He obtained default judgments against the Santa Fé and its garnishee. The Santa Fé sought to enjoin their enforcement in the Texas federal courts. A decree dismissing its bill was affirmed by the Circuit Court of Appeals, Fifth Circuit, 285 Fed. 369, and the case was taken on certiorari to the United States Supreme Court, which has reversed the judgment.

The Supreme Court holds that the writ of garnishment was void because of the purpose for which it was invoked. The Santa Fé is a foreign corporation. It had not been admitted to Texas as a foreign corporation. It had not consented to be sued there. It did not own or operate any line of railroad within the state; and it had no agent there. The Texas statutes were construed and applied in the suit against the company so as to permit a cause of action which arose elsewhere against a railroad corporation of another state, which is engaged in interstate commerce, which neither owns nor operates a railroad in Texas, and which has not consented to be sued there. The Supreme Court holds that such a suit unreasonably burdens interstate commerce; and the statute as construed and applied is invalid.

Relief against the void judgments entered was held properly sought by the Santa Fé in the federal court. The garnishment was void because seizure of the rolling stock and credits for the purpose of compelling the Santa Fé to submit to the jurisdiction of the court in the principal suit interfered unreasonably with interstate commerce. The Santa Fé was not obliged to assert its rights in the courts of Texas. Nor could its right not to be sued there be affected by anything which the garnishee did or omitted to do. Atchison, Topeka & Santa Fé v. Wells. Opinion by Justice Brandeis. Decided May 12, 1924.

Foreign Railway News

Strike Danger Avoided in Cuba

The threatened strike by the employees of the United Railways of Havana has been settled by an agreement with the officers of the road, according to Commerce Reports. The principal provisions of this agreement are as follows:

The railway company recognizes and agrees (1) to the Union of Railway Employees of Cuba and the right of its delegates to a hearing; (2) to the establishment of committees of adjustment in all of the departments of the railway, such committees to consist of three delegates elected from the personnel of each department under the supervision of the chief of the department and a representative of the employees' union; (3) to consult with representatives of the union before making a general reduction in wages; (4) to compensate employees who perform the duties of employees in higher positions than their own for more than a month, at a compensation corresponding to those duties; (5) to equalize the salaries of brakemen on general merchandise trains on all its lines; (6) to pay particular attention to the matter of lodgings for personnel doing night duty at the terminals; (7) to promote or demote employees according to length of service and ability to meet requirements of the higher positions, and to pay time-and-a-half for overtime.

Commencing April 1, the railway authorizes the following increases in compensation: Salaries ranging from \$1 to \$49 per month, 20 per cent increase; from \$50 to \$99, 15 per cent; from \$100 to \$149, 10 per cent. Salaries of more than \$150 a month shall not receive any increase, nor shall the above schedule apply to the salaries of those who have already received promotions in salary since the first of January and who are in adequate relation to the existing schedule.

It is estimated that the above agreement will cost the railroad approximately \$1,300,000. According to the general manager, this amount will not be raised by asking increased transportation rates, it being stated that the shareholders in Great Britain had already authorized approximately that sum to be given as a bonus at the close of the present fiscal year.

In view of the above concessions it is understood that the Union of Railway Employees will not make any demands for further increases until after the fiscal year ended June 30, 1925, and that they will not join in sympathetic strikes.

Japan Notes—Experimental Locomotive

on the South Manchurian

The Japanese Department of Railways has finished all plans for the operation of electric trains on the Tokio-Odawara section of the main line between Tokio and Kobe. The electrification scheme which was adopted but oftentimes dropped for financial considerations is to be actually carried out. A trial trip of an electric locomotive and coaches was run on the section recently. The result of the trial run has not yet been made public. It is not yet known definitely when electric train service will be started on the section.

While the Japanese government has turned to electrification with a view to economizing in coal, the South Manchuria Railway, which has its own extensive coal seams along its own lines in Manchuria, is studying how to use its own coal economically. The company claims to have almost perfected a device which will assure almost complete combustion and thereby save coal and do away with the smoke nuisance.

Toward the close of last year the company built a new type of freight locomotive in its own shops in which all the results of its investigations and researches were embodied. The locomotive which has been run on its line for trial since has proved an effective economizer of coal. Its combustion is said to be almost perfect. The locomotive has undergone some alterations and is now being given a further trial on the section between Dairen and Gaboten.

Applications for the grant of charters for new railways and tramways, which have been increasing since the government announcement of its policy to grant more effective help than before

to operators of private railways and tramways, are officially announced to have reached 173 up to the close of the first week of April. The total mileage of those prospective lines is estimated at 2,105 miles. If all those applications are granted, and that total mileage is to be laid soon, they will call up 747,762,000 yen as mere building expenses.

China Notes—Earnings Good in Spite of High Interest Payments

PEKING.

The eighth annual report issued by the Ministry of Communications was issued to the public about a fortnight since. It covers the operations of the year 1922. Heretofore this publication has borne the title "Statistics of Government Railways" but for 1922 it bears the title "Statistics of Railways." The change of title is due to the inclusion for the first time of condensed statistics from other important lines within the territorial confines of the Republic of China but which are not government railways. A second part of the report deals with the Chinese Eastern, Shantung, South Manchurian, Yunnan and Kowloon-Canton lines. The totals for the government lines are given in the same tables, so that the comparison becomes easy and is of great interest. The high degree of traffic development on the South Manchurian line compared with the others is an outstanding item. The report also includes among the government lines for the first time partial statistics for the Lung-Hai line. Portions of this line have been in service for seven years, but it is still under construction. As a matter of fact, amortization of the original construction loan has become due, but for the reason that the line is not complete, repayment has been postponed.

Approximate financial returns for the year 1923 have been made public by the Ministry of Communications. Compared with the actual returns for the year 1922 the results are as follows:

	1923	Increase
Operating revenues	\$120,613,000	\$21,056,000
Operating expenses	66,612,000	9,952,000
Net operating revenue	54,001,000	11,164,000
Income debits (interest, etc.)	30,400,000	11,840,000
Income credits	1,966,000	285,000
Net income debits	26,434,000	11,554,000
Surplus for the year	25,566,000	Decr. 450,000

The outstanding features of this return are the large increase in revenue, both operating and net, and the fact that in spite of these favorable operating results the financial results show a decrease. This is attributable to high interest rates on numerous short term loans which the government has contracted on the credit of certain lines, but it is also due, probably, to the practice of certain lines including among their income debits certain large items of an interline nature from which they will be relieved before the accounts for the year are finally closed. The 1922 approximate returns contained an error of about \$2,500,000 in its income debits from this cause. Large increases in revenues are reported by all of the important lines except the Peking-Mukden. A decrease of over \$2,000,000 on this line is explained in part by the fact that the 1922 figures contained the revenues of the "outside Wall" portion of the line up to May 1, 1922, after which it was seized by Chang Tso-lin. But allowing for that, the Peking-Mukden line is peculiar in showing nothing of the customary increase during a year of quiet. The above returns include those for the Shantung Railway which were not included in 1922, which accounts for \$9,400,000 of revenue and reduces the rate of increase in that item to about 11 per cent. The increases in expenses and income debits are corresponding in proportion.

During the last few days of the preceding month a conference of the mechanical officers of the several lines was held at the Ministry of Communications to consider methods of improving efficiency in lubrication costs and to pass upon certain details in the design of standard passenger equipment. The conference was opened by a statement from the Ministry to the effect that car lubrication varied on the several lines between 0.17 cents per train kilometer on the Lung-Hai to 2.20 on the Shanghai-Nanking line, and for locomotive lubrication expense varied from 0.95 cents on the Peking-Hankow to 2.95 on the Shanghai-Hangchow-Ningpo. Fuel costs were also mentioned. The conference appointed a committee headed by Adviser F. H. Clark to draw up lubrication specifications to be observed in purchasing. The Standing Committee on Railway Accounts and Statistics expects to draw up uniform fuel accounts as soon as the subject of uniform workshop accounts has been concluded.

Equipment and Supplies

Locomotives

THE CORNWALL RAILROAD has ordered one, 4-4-0 type locomotive from the Baldwin Locomotive Works.

THE NATIONAL RAILWAYS OF MEXICO have ordered from the Baldwin Locomotive Works 10 standard gage Mikado type locomotives, 22 standard gage Consolidation type locomotives, 8 narrow gage Consolidation type locomotives, 10 narrow gage 4-6-0 type locomotives and 1 gas-electric locomotive.

Freight Cars

THE AMERICAN RADIATOR COMPANY is inquiring for 1 flat car.

THE PERE MARQUETTE is inquiring for 34 underframes for caboose cars.

THE CENTRAL VERMONT is inquiring for 12 steel underframes for caboose cars.

THE DELAWARE, LACKAWANNA & WESTERN is inquiring for 40, 8-wheel caboose cars.

THE NORTHERN PACIFIC is inquiring for 20 center sill reinforcements for caboose cars.

THE CHICAGO, ROCK ISLAND & PACIFIC is inquiring for repairs to 250 refrigerator cars.

THE WABASH has ordered 200 center sill reinforcements from the Decatur Iron Works.

THE TONOPAH & TIDEWATER is inquiring for 3 or 4 self-clearing, hopper bottom, gondola cars.

THE PHILLIPS PETROLEUM COMPANY, reported in the *Railway Age* of May 10 as inquiring for 200 tank cars of 8,000 gal. capacity, has ordered 125 tank cars from the General American Tank Car Corporation.

THE FLORIDA EAST COAST, reported in the *Railway Age* of April 19 as inquiring for 200 ventilated box cars and 20 caboose cars, has ordered this equipment from the Mount Vernon Car & Manufacturing Co.

THE GARY TUBE COMPANY, reported in the *Railway Age* of March 1 as inquiring for 36 skelp cars, has ordered 17 skelp cars of 100 tons' capacity and 13 of 70 tons' capacity, from the Pressed Steel Car Company.

Passenger Cars

THE BALTIMORE & OHIO is inquiring for 80 steel electric motor cars for its Staten Island lines.

THE NORTHERN PACIFIC has placed an order for repairs to 5 dining cars with the Pullman Company.

THE ATCHISON, TOPEKA & SANTA FE, reported in the *Railway Age* of April 26 as inquiring for 20 baggage cars, has ordered this equipment from the Pullman Company.

THE FLORIDA EAST COAST, reported in the *Railway Age* of April 19 as inquiring for 3, 70-ft. passenger coaches, has ordered this equipment from the Pullman Company.

THE BESSEMER & LAKE ERIE, reported in the *Railway Age* of March 15 as inquiring for 6 combination baggage and passenger cars, 3 combination baggage and mail cars and 3 baggage cars, has ordered this equipment from the Pressed Steel Car Company.

Iron and Steel

THE READING COMPANY is inquiring for 200 tons of steel for bridges.

THE NEW YORK CENTRAL is inquiring for 1,400 tons of steel for bridges.

THE CENTRAL OF NEW JERSEY is inquiring for 900 tons of steel for a bridge at Somerville, N. J.

THE LEHIGH VALLEY has ordered 130 tons of steel for bridges from the Bethlehem Steel Corporation.

THE ATLANTIC COAST LINE has ordered 250 tons of steel for bridges from the American Bridge Company.

THE NORFOLK & WESTERN has ordered 700 tons of steel for bridges from the Mount Vernon Bridge Company.

THE LONG ISLAND has ordered 750 tons of steel for transfer bridges from the Shoemaker Satterthwait Bridge Company.

THE PENNSYLVANIA has ordered 100 tons of steel for bridges from the Bethlehem Steel Corporation and has bids in for 350 tons additional.

THE FLORIDA EAST COAST has ordered 400 tons of bridge steel from the Phoenix Bridge Company and 850 tons from the Virginia Bridge & Iron Company.

Machinery and Tools

THE MISSOURI PACIFIC has placed an order for a 100-ton bushing press.

THE CHICAGO, ROCK ISLAND & PACIFIC has placed an order for a 400-ton wheel press.

THE ATCHISON, TOPEKA & SANTA FE has ordered five electric cranes from the Shaw Electric Crane Company for use at its San Bernardino, Cal., shops.

Miscellaneous

THE UNITED STATES BUREAU OF MINES is inquiring for 1 mine rescue car.

THE CHICAGO, BURLINGTON & QUINCY has ordered 100 section motor cars from Mudge & Co.

Ann Arbor Orders New Car Ferry

The Ann Arbor Boat Company, a subsidiary of the Ann Arbor Railroad, has placed a contract with the Manitowoc Shipbuilding Company, Manitowoc, Wis., for the construction of a new steel car ferry, to be known as "No. 7." The boat is to have a length of 360 ft. and a beam of 56 ft., and will be propelled by two vertical triple expansion steam engines turning twin screws. Steam will be supplied by four Scotch boilers burning coal for fuel. The steamer will have a capacity of 30 standard freight cars, the main deck having four tracks. The cabin arrangement will be for the accommodation for a crew of 46 men, with passenger accommodations consisting of 12 staterooms, each stateroom to be fitted with double berths.

April Shipments of Locomotives

The Department of Commerce has prepared the following table showing April shipments of railroad locomotives, from the principal manufacturing plants, based on reports received from the individual establishments:

Year and month	LOCOMOTIVES					
	Shipments			Unfilled orders		
	Total	Domestic	Foreign	Total	Domestic	Foreign
1923						
January	229	217	12	1,788	1,699	89
February	207	196	11	2,220	2,141	79
March	282	269	13	2,316	2,214	102
April	217	201	16	2,204	2,111	93
May	238	228	10	2,150	2,045	105
June	232	221	11	1,958	1,854	104
July	239	211	28	1,738	1,652	86
August	272	259	13	1,497	1,406	91
September	335	313	22	1,178	1,102	76
October	310	295	15	977	915	62
November	299	270	29	691	656	35
December	329	305	24	387	365	22
1924						
January	151	147	4	376	344	32
February	99	92	7	499	466	33
March	132	128	4	534	494	40
April	73	63	10	640	586	54

Supply Trade News

The Illinois Clay Products Company has removed its main office from Oglesby, Ill., to the Barber building, Joliet, Ill.

The Federal Cement Tile Company has removed its offices from 110 South Dearborn street to 608 South Dearborn street, Chicago.

J. E. Otis, Jr., vice-president of the Bassick Manufacturing Company, with headquarters at Chicago, has been promoted to vice-president and general manager, succeeding E. S. Fesler, resigned. Mr. Otis was born on November 19, 1892, at Chicago, and graduated from Yale University in 1916. In the same year he entered the employ of the Linde Air Products Company in the plant engineering department, at Baltimore, O. In 1918 he was promoted to assistant manager, with headquarters at Buffalo, N. Y., which position he held until 1920, when he was promoted to assistant general superintendent of plants, with headquarters at New York. He entered business for himself in June, 1920, as vice-president and treasurer of the H. O. King Company, Chicago, and in March, 1923, was appointed assistant treasurer of the Bassick Manufacturing Company, with headquarters at Chicago. Later in the same year he was promoted to vice-president, which position he has held until his recent promotion.



J. E. Otis, Jr.

L. S. Carroll, general purchasing agent of the American Locomotive Company, New York, has been elected vice-president in charge of purchases. Mr. Carroll entered the service of the Chicago & North Western about 1886 as a helper at a station in Dakota. He learned telegraphy and later served as operator and station agent. He was then transferred to the accounting department in Chicago where he served consecutively as travelling auditor and general travelling auditor, until his appointment in 1901 as purchasing agent. He subsequently became general purchasing agent for both the Chicago & North Western and the Chicago, St. Paul, Minneapolis & Omaha railroads. During government operation of the railroads Mr. Carroll was chairman of the Northwestern Regional Purchasing Committee and on the return of the railroads to their owners Mr. Carroll went on March 1, 1920, to the American Locomotive Company as general purchasing agent, which position he held until his recent appointment as vice-president in charge of purchases of the same company.



L. S. Carroll

The Vanadium Alloys Steel Company, Latrobe, Pa., has removed its New York City office from 143 Liberty street to 270 Madison avenue.

Joseph T. Ryerson & Son, Incorporated, Chicago, has taken over the exclusive distribution of Lewis special staybolt iron manufactured by the Penn Iron & Steel Company, Creighton, Pa.

Raul Simon has been appointed New York representative of the Chilean State Railways, with headquarters at room 702, 141 Broadway, New York City. Mr. Simon succeeds Carlos Schneider, who is returning to Chile via Europe.

George S. Hays, general manager of the Fidelity division of the Long Bell Lumber Company, with headquarters at Doucette, Tex., has been transferred to Long View, Wash., as assistant to the general western manager.

The Bucyrus Company, South Milwaukee, Wis., has appointed the Borchert-Ingersoll Company, St. Paul, Minn., its agent for the sale of small revolving shovels and dragline excavators for the states of Minnesota, North Dakota and South Dakota.

L. D. Albin, general sales manager of the Ingersoll-Rand Company, New York City, has been elected vice-president in charge of European sales, and D. C. Keefe, assistant general sales manager, has been appointed general sales manager to succeed Mr. Albin.

George R. Hine is now in charge of the factory management of the New Process Twist Drill Company, Taunton, Mass. Mr. Hine served as general superintendent of the Whitman & Barnes Manufacturing Company, Akron, Ohio, for the past 15 years and was associated with that company for over 23 years.

J. A. Turner, formerly purchasing agent of the Mobile & Ohio, has been appointed representative of the Fairmount Railway Motors, Inc., with headquarters in the Transportation building, Washington, D. C. L. R. Payton has been appointed representative, with headquarters in the Railway Exchange building, St. Louis, Mo.

J. L. Levay has joined the sales force at the Chicago office of the Browning Company, Cleveland, Ohio, manufacturers of locomotive cranes. H. K. Robinson has joined the Browning organization and will represent the company in its St. Louis territory, with headquarters at the company's offices, Federal Reserve Bank building, St. Louis, Mo.

The Goodwin Side Bearing Company, Inc., with office at 110 East Forty-second street, New York City, has been organized with the following officers: Douglas I. McKay, president, E. G. Goodwin and W. Eckels, vice-presidents, and E. F. Pride, secretary and treasurer. This company will manufacture and sell roller side bearings for railway cars.

The National Railway Appliance Company of New York, with offices also at Boston and Washington, on July 14, will discontinue to act as agents for the Drew Electric & Manufacturing Company's line material and railway specialties in the eastern territory. Effective July 17, the Hegeman-Castle

Corporation and Holden & White, Inc., of Chicago, which are owned by the National Railway Appliance Company, New York, will terminate their connections with the Drew Electric Manufacturing Company in the middle west territory.

G. A. Morrison, secretary and sales manager of the Bucyrus Company, Milwaukee, Wis., has been promoted to second vice-president in charge of sales in addition to his duties as secretary. D. P. Eells, treasurer and manager of the foreign and export departments has been promoted to second vice-president in charge of the foreign and export departments in addition to his duties as treasurer. William Bager, chief engineer, has been promoted to second vice-president in charge of engineering.

Official announcement has been made that the British government, through the Surplus Stores and Liquidation Department in London, has accepted the tender of the Montreal firm of Hope E. Scott & Company, Ltd., on approximately 47,000 tons of unassembled freight car materials which were manufactured during the war by Canadian car builders, including the Canadian Car & Foundry Company and the Eastern Car Company, for the Russian government. Through the failure of the Russian government to take delivery of the cars at the time, the materials have been lying in storage at different points in Canada since 1917, but principally at Vancouver. It is the intention of the Scott firm to rebuild the cars for export to Japan. The transaction involves the reconditioning of approximately 4,000 cars. The re-sale value of the cars after reconditioning will be about \$6,000,000. Work will begin on them in about a month.

Obituary

Robert F. Horsey, for the past six years office manager of the order department of the National Lock Washer Company, Newark, N. J., died suddenly on May 12. Mr. Horsey entered the employ of the National Lock Washer in 1912 and for six years served in the sales department. On September 1, 1918, he was appointed manager of the order department and office manager.

Trade Publications

ELECTRICAL HISTORY.—"Forty Years Ago" is the title of a 21-page booklet illustrated with pen and ink sketches, published by the Westinghouse Electric & Manufacturing Company. The booklet describes briefly electrical progress which has been made during the past 40 years and the relation of the Westinghouse Company to this progress.

SMALL WOOD PRESERVING PLANT.—A small 4-page, illustrated booklet has recently been issued by Grant B. Shipley, engineer, Pittsburgh, Pa., descriptive of a small wood preserving plant which has been developed primarily for small users of timber. This type of plant is built in several different sizes and the text describes the different capacities, the advantages, the construction, the type of treatment and the method of operation. The arrangement, operation, etc., is similar to that used in the large plants of the Century Wood Preserving Company.

LOCOMOTIVE REPAIR SITUATION—FORMER METHOD OF COMPILATION

Date	No. locomotives on line	No. serviceable	No. stored serviceable	No. held for repairs req. over 24 hours	Per cent	No. held for repairs req. less 24 hours	Per cent	Total held for repairs	Per cent
January 1	64,453	48,905	576	13,587	21.1	1,962	3.0	15,549	24.1
April 1	64,559	50,107	914	12,801	19.8	1,651	2.6	14,452	22.4
July 1	63,906	52,456	2,181	10,326	16.2	1,124	1.8	11,450	18.0
October 1 1924	63,982	54,159	2,620	8,789	13.7	1,034	1.6	9,823	15.3
January 1	64,406	54,031	5,061	9,395	14.6	980	1.5	10,375	16.1

LOCOMOTIVE REPAIR SITUATION—NEW METHOD OF COMPILATION

Date	No. locomotives on line	No. serviceable	No. stored serviceable	No. req. classified repairs	Per cent	No. req. running repairs	Per cent	Total req. repairs	Per Cent
February 1	64,377	53,586	4,116	5,919	9.2	4,872	7.6	10,791	16.8
March 1	64,431	53,127	3,800	6,047	9.4	5,257	8.1	11,304	17.5
April 1	64,363	52,805	4,648	6,128	9.5	5,430	8.4	11,558	17.9
May 1	64,330	52,890	6,079	6,105	9.5	5,335	8.3	11,440	17.8

Railway Construction

ASHERTON & GULF.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a line of 208 miles from Asherton and Del Rio to Corpus Christi, Tex.

ATCHISON, TOPEKA & SANTA FE.—This company plans the construction of an ice plant and icing dock at Winslow, Ariz.

CHESAPEAKE & OHIO.—This company will close bids on May 27 for the construction of a pumping station and the laying of a pipe line at Gladstone, Va. This company closed bids on May 22 for the construction of a passenger station at Ashland, Ky.

CHICAGO & WESTERN INDIANA.—This company is calling for bids for the laying of approximately 10,000 ft. of 6 in. and 8 in. cast iron, high pressure, pipe line at Fifty-first street, Chicago.

CHICAGO, BURLINGTON & QUINCY.—This company is calling for bids for the construction of a brick passenger station at Shenandoah, Iowa. This company is also calling for bids for the construction of an interlocking tower at Aurora, Ill.

GRAND TRUNK WESTERN.—This company closed bids on May 21 for the construction of an enginehouse and repair shop at Battle Creek, Mich., reported in the *Railway Age* of May 17. This company is calling for bids for the construction of viaducts in the grade separation project at Flint, Mich., at an estimated cost of \$100,000.

ILLINOIS CENTRAL.—This company is calling for bids for the construction of a mail terminal at Memphis, Tenn., reported in the *Railway Age* of March 22.

MISSOURI PACIFIC.—This company is calling for bids for bridge filling for twelve bridges on the White River division. The project is estimated to cost \$200,000.

PENNSYLVANIA.—This company has awarded a contract for the construction of boiler shop No. 2 at its Juniata shops to the Columbia Construction Company, Altoona, Pa. The work will cost approximately \$45,000.

SOUTHERN.—This company has awarded a contract to the Brimer & England, Knoxville, Tenn., for the construction of a frame freight station, 100 ft. by 34 ft. at Greenville, Tenn.

SOUTHERN WOOD PRESERVING COMPANY.—This company plans the immediate construction of a timber-treating plant at Chattanooga, Tenn., which will treat ties for the Nashville, Chattanooga & St. Louis and other railways entering Chattanooga.



Lunch Counter in a C. N. R. Colonist Car

Railway Financial News

ATLANTIC COAST LINE.—Extra Dividend.—The directors have declared an extra dividend of one per cent on the common stock in addition to the regular common stock dividend of 3½ per cent, both payable July 10 to stock of record June 18.

CENTRAL NEW ENGLAND.—Valuation.—The Interstate Commerce Commission has served a tentative valuation of this company's carrier property as of June 30, 1916, in which it finds that the final value of the property owned was \$13,812,880, and that of the property used was \$22,063,019, as compared with an adjusted investment in road and equipment of \$22,744,204. The final value of the Hartford & Connecticut Western was found to be \$5,000,000, as compared with a property investment account of \$4,163,936.

CHICAGO & EASTERN ILLINOIS.—Annual Report.—The annual report for the year ended December 31, 1923, shows a net income of \$1,308,133 as compared with \$787,344 in 1922. A selection of the principal items in the income account follows:

	1923	1922	Increase or Decrease
Average mileage operated.....	945	945	
Freight revenue.....	\$21,243,932	\$18,257,138	\$2,986,794
Passenger revenue.....	5,029,040	4,580,655	448,385
Total operating revenue.....	28,405,408	24,731,348	3,674,060
Maintenance of way and structures.....	3,144,876	2,782,201	362,675
Maintenance of equipment.....	8,694,382	6,567,570	2,126,812
Traffic.....	539,476	508,835	30,640
Transportation—rail line.....	10,948,327	10,354,312	594,014
General.....	824,001	792,108	31,892
Total operating expenses.....	24,279,112	21,134,733	3,144,378
Net revenue from railway operations.....	4,126,295	3,596,614	529,681
Railway tax accruals.....	1,555,000	1,155,000	400,000
Railway operating income.....	2,563,430	2,435,876	127,555
Total operating income.....	4,271,052	3,841,589	429,464
Net railway operating income.....	3,324,117	2,721,469	602,647
Gross income.....	3,769,047	3,115,258	653,790
Total deductions.....	2,460,914	2,327,914	133,000
Net income.....	1,308,133	787,344	520,789
Income applied to sinking and other reserve funds, etc.....	196,171	184,667	11,504
Balance of income transferred to profit and loss.....	1,111,962	602,676	509,286

CHICAGO, INDIANAPOLIS & LOUISVILLE.—Bonds.—This company has applied to the Interstate Commerce Commission for authority to sell \$1,000,000 of first and general mortgage 6 per cent bonds, heretofore nominally issued, at not less than 96, to Potter & Co., New York, with a proviso that the railroad shall share to the extent of one-half of the proceeds in excess of 98, if any.

CHICAGO, MILWAUKEE & ST. PAUL.—Bonds.—This company has applied to the Interstate Commerce Commission for authority to issue \$3,300,000 of general mortgage bonds to be pledged and repledged from time to time as collateral for short term loans.

DULUTH, MISSABE & NORTHERN.—Annual Report.—The annual report for the year ended December 31, 1923, shows a net income of \$10,195,983 as compared with \$6,072,983 in 1922. The income account compares as follows:

	1923	1922	Increase or decrease
Freight revenue—iron ore.....	\$18,157,851	\$11,768,196	\$6,389,655
Freight—miscellaneous.....	1,925,603	1,532,764	392,839
Passenger.....	214,141	420,958	—206,817
Total operating revenues.....	22,253,554	14,976,811	7,276,743
Maintenance of way and structures.....	2,013,574	1,899,053	114,520
Maintenance of equipment.....	2,331,336	1,855,429	475,906
Traffic.....	39,374	37,927	1,447
Transportation.....	4,428,157	3,494,403	933,754
General.....	271,820	244,129	27,691
Total operating expenses.....	9,097,748	7,551,484	1,546,264
Net revenue from railway operations.....	13,155,806	7,425,328	5,730,478
Railway tax accruals.....	2,479,572	876,698	1,602,874
Total operating income.....	10,676,232	6,548,599	4,127,633
Gross income.....	11,324,124	7,078,384	4,245,740
Total deductions.....	1,128,141	1,066,083	122,057
Balance of net income.....	10,195,983	6,072,300	4,123,683

EL PASO & SOUTHWESTERN.—Annual Report.—The annual report for the year ended December 31, 1923, shows a net income of \$1,704,096 as compared with \$1,945,866 in 1922. The corporate income account follows:

	1923	1922	Increase or decrease
Railway operating revenues.....	\$12,649,044	\$11,389,665	\$1,259,379
Railway operating expenses.....	9,329,825	7,727,063	1,602,762
Net revenue from railway operations.....	3,319,219	3,662,601	—343,383
Railway tax accruals.....	1,109,628	980,192	129,436
Railway operating income.....	2,209,591	2,681,574	—471,983
Total operating income.....	2,205,085	2,666,547	—461,462

	1923	1922	Increase or decrease
Gross income	4,081,060	4,254,659	—173,599
Total deductions from gross income	2,376,964	2,308,793	68,171
Net income	1,704,096	1,945,866	—241,771
Dividend appropriation of net income	1,562,500	1,500,000	62,500
Balance to profit and loss	141,596	445,866	—304,271

GREAT NORTHERN.—Bonds Sold.—J. P. Morgan & Co. and the First National Bank have sold privately at 92½ and interest, to yield 5.45 per cent, \$15,000,000 general mortgage 5 per cent bonds, series "C," due 1973. The Interstate Commerce Commission has authorized the sale of these bonds, the proceeds of which will be used to reimburse the road's treasury for expenditures.

INDIANA HARBOR BELT.—Equipment Trust.—The Interstate Commerce Commission has authorized an issue of \$375,000 of equipment trust certificates to be sold at not less than 97.56.

INTERNATIONAL-GREAT NORTHERN.—Annual Report.—The annual report for the year ended December 31, 1923, shows an income balance of \$431,511 as compared with \$247,518 in 1922. The consolidated income account follows:

	1923	1922	Increase or Decrease
Freight revenue	\$11,607,925	\$10,733,365	\$874,560
Passenger revenue	2,773,103	2,479,458	293,645
Total operating revenue	15,806,608	14,674,116	1,132,492
Maintenance of way and structures	2,965,152	2,273,391	691,761
Maintenance of equipment	2,742,532	2,831,968	—89,437
Traffic	379,569	318,233	61,336
Transportation	5,879,493	6,222,478	—342,984
General	573,836	568,999	4,837
Total operating expenses	12,542,633	12,280,300	262,333
Net operating revenue	3,263,975	2,393,816	870,159
Taxes	485,295	392,817	92,478
Operating income	2,175,926	1,318,389	857,538
Total income	2,336,379	1,452,356	884,023
Total deductions from income	41,134	24,071	17,063
Balance available for interest, etc.	2,295,245	1,428,285	866,961
Interest on fixed charge obligations	1,183,734	1,180,767	2,968
Balance available for interest on adjustment mortgage bonds	1,111,511	247,518	863,993
Interest on adjustment mortgage bonds at 4%	680,000	680,000	0
Balance of income	431,511	247,518	183,993

*The adjustment mortgage provides that the adjustment bonds did not rank for interest until January 1, 1923. In accordance with the terms of the adjustment mortgage, interest for the year 1923, at the rate of 4 per cent, was declared by the board of directors to be payable on April 1, 1924.

Note—The year 1922 includes eleven months of receiver's operations and one month of the new company, which commenced operations on December 1, 1922. The interest shown for the year 1922 is based on the interest bearing obligations of the new company.

LOUISVILLE & NASHVILLE.—Dividend Increased.—The directors have declared a semi-annual dividend of 3 per cent on the common stock, payable August 11 to stock of record July 15. This compares with semi-annual dividends of 2½ per cent paid in February, 1924, and in August, 1923. The increase was anticipated by the board in March, 1923, when a stock dividend of 62½ per cent was declared and the cash dividend rate was reduced from 7 to 5 per cent.

MARYLAND & PENNSYLVANIA.—Securities.—This company has been authorized by the Interstate Commerce Commission to issue \$450,000 of first consolidated mortgage 6 per cent bonds and \$450,000 of common stock, to be exchanged for \$900,000 of income bonds outstanding, which, together with \$100,000 of first mortgage bonds, are to be pledged with the trustee under the first consolidated mortgage.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—Annual Report.—The annual report for the year ended December 31, 1923, shows a net income of \$1,241,429 as compared with \$499,046 in 1922. A selection of the principal items in the income account follows:

	1923	1922
Freight revenue	\$21,985,382	\$21,316,638
Passenger revenue	4,470,881	4,369,799
Total operating revenue	28,957,095	28,266,940
Maintenance of way and structures	4,063,621	4,404,692
Maintenance of equipment	5,178,479	4,534,255
Traffic	402,694	430,828
Transportation	11,422,054	11,589,080
General	724,888	731,709
Total operating expenses	21,889,105	21,777,900
Net operating revenue	7,067,990	6,489,040
Railway tax accruals	1,838,311	2,129,705
Railway operating income	5,212,365	4,359,334
Gross income	6,722,328	5,902,041
Total deductions from gross income	5,480,899	5,402,994
Net income	1,241,429	499,046

New Director.—At the stockholders' annual meeting, E. L. Carpenter, of Minneapolis, was elected a director. Other directors were re-elected. The stockholders passed a resolution increasing the board to 15, and when this is approved, John Crosby, president of the Washburn-Crosby Company, and Russell M. Bennett, of Minneapolis, will become directors.

MISSOURI PACIFIC.—Control of Gulf Coast Lines.—See New Orleans, Texas & Mexico.

MUSCATINE, BURLINGTON & SOUTHERN.—Abandonment.—The Interstate Commerce Commission has issued a certificate authorizing the receiver to abandon this company's line from Muscatine to Burlington, Ia., 53.8 miles.

NEW ORLEANS, TEXAS & MEXICO.—16½ Per Cent Dividend.—Control by Missouri Pacific.—The directors on Monday declared a 16½ per cent dividend on the capital stock, payable June 2, 1924, to stock of record May 26. The dividend will be paid 4½ per cent in cash, 6 per cent in warrants maturing September 1 and 6 per cent in warrants maturing December 1, 1924. The regular quarterly dividend of 1¼ per cent was also declared, payable June 2 to stock of record May 26.

After the directors' meeting the following announcement was issued regarding the offer of the Missouri Pacific to purchase control of the New Orleans, Texas & Mexico:

The Missouri Pacific has agreed to purchase from Harriman & Co. and Blair & Co., Inc., as of June 2, 1924, 37,500 shares of New Orleans, Texas & Mexico stock at \$120 a share, payable in 15 months 7 per cent notes of the purchasing company, and has taken options, subject to the approval of the Interstate Commerce Commission, on 39,000 additional shares, payable in 15-year 7 per cent collateral trust notes, redeemable at par and to be retired by a sinking fund at the rate of \$1,200,000 annually. The collateral security for both classes of notes is to be the pledge of all the stock acquired through their issuance. If the Interstate Commerce Commission approves the issue of the 15-year notes, the Missouri Pacific has the right up to 20 days after such approval is given to elect to require the exchange of 15-month notes for the 15-year 7 per cent notes, par for par.

The New Orleans, Texas & Pacific has withdrawn its application to the Interstate Commerce Commission for the payment of a 10 per cent stock dividend, and in conformity with an agreement between the Missouri Pacific and the Harriman group has declared a special dividend, of which present stockholders will get the benefit, amounting to 16½ per cent, or \$2,475,000, payable June 2, 1924, 4 per cent in cash, 6 per cent in warrants due September 1 and 6 per cent in warrants due December 1. Stockholders effecting the sale of their stock through the bankers are to pay the bankers a commission of 5 per cent on the purchase price of \$120 a share. Thus, for each share of stock sold, the stockholders will receive \$114 principal amount of Missouri Pacific notes. This will make the net price of their stock to the stockholders effecting their sales through the bankers, including the extra dividend, equivalent to \$130.50 a share.

Indentures securing the proposed 15-year 7 per cent notes will provide that during the life of the notes the existing divisions of through rates as between the Missouri Pacific and the New Orleans, Texas & Mexico shall be maintained, and that similar provisions shall apply to the International Great Northern, provided that the pending application to purchase the stock of that road by the New Orleans, Texas & Mexico shall be approved. The Missouri Pacific will also be bound by the terms of the indenture to maintain the way and equipment of the acquired companies in as good and serviceable condition as it is at the date of the indenture.

While the Missouri Pacific has purchased an option on only a combined total of 51 per cent of the outstanding New Orleans, Texas & Mexico stock, it has agreed with bankers that subject to the approval of the commission, it will purchase from them on the same terms all the Gulf Coast shares tendered by the bankers within 90 days of the exercise of the option on the 39,000. In this event it is the purpose of the bankers to offer all New Orleans, Texas & Mexico stockholders the right to participate on like terms.

NEW YORK & HARLEM.—New Director.—Patrick E. Crowley, president of the New York Central, has been elected a director to succeed A. H. Smith, deceased.

OSAGE.—Stock.—This company has applied to the Interstate Commerce Commission for authority to issue and sell \$255,800 of common stock to reimburse the treasury for expenditures.

PELHAM & HAVANA.—Abandonment.—The Interstate Commerce Commission has issued a certificate authorizing the receiver to abandon this company's line from Cairo, Ga., to Havana, Fla., 25.3 miles.

ROME & NORTHERN.—Abandonment.—The Interstate Commerce Commission has issued a certificate authorizing the abandonment of this company's line from West Rome to Gore, Ga., 17.6 miles.

RUTLAND.—Equipment Trust.—The Interstate Commerce Commission has authorized an issue of \$825,000 of equipment trust certificates to be sold at not less than 96.96.

RUTLAND.—Annual Report.—The annual report for the year ended December 31, 1923, shows a surplus for the year of \$463,909 as compared with \$153,036 in 1922. A selection of the principal items in the income account follows:

	1923	1922	Increase or Decrease
Mileage operated	413	413	0
Freight revenue	\$3,852,408	\$3,167,577	\$684,831
Passenger revenue	1,529,975	1,477,880	52,095
Total operating revenues	6,695,786	5,803,158	892,629
Maintenance of way and structures	1,205,009	1,088,292	116,717
Maintenance of equipment	1,272,970	1,116,251	156,720
Traffic	107,248	100,336	6,912
Transportation	2,868,153	2,610,526	257,627
General	155,673	160,799	—5,126
Total operating expenses	5,628,599	5,094,821	533,778

	1923	1922	Increase or decrease
Net revenue from railway operations	1,067,187	708,337	358,851
Railway tax accruals	281,170	262,776	18,394
Railway operating income	785,918	445,492	340,421
Net railway operating income	868,143	530,433	337,711
Gross income	919,741	604,562	315,178
Total deductions from gross income	455,832	451,526	4,305
Surplus for the year	463,909	153,036	310,873

ST. LOUIS-SAN FRANCISCO.—*Annual Report.*—The annual report for the year ended December 31, 1923, shows a balance after interest of \$3,762,859 as compared with \$753,013 in 1922. The consolidated income account compares as follows:

	1923	1922
Average mileage operated	2,246	2,246
Freight revenue	\$62,498,060	\$57,578,629
Passenger revenue	20,597,709	19,121,518
Total operating revenues	89,633,152	83,008,023
Maintenance of way and structures	12,280,066	12,449,271
Maintenance of equipment	15,731,277	12,963,789
Maintenance of equipment—depreciation	2,637,858	2,405,897
Traffic	1,235,363	1,085,360
Transportation	31,993,099	31,590,514
General	2,546,626	2,449,462
Total operating expenses	65,934,620	62,631,731
Net operating revenue	23,698,532	20,376,291
Railway tax accruals	4,289,337	3,726,684
Operating income	18,653,881	15,361,834
Gross income	19,105,708	15,857,484
Total deductions from income	766,241	672,272
Balance available for interest, etc.	18,339,468	15,184,212
Interest on fixed charge obligations	10,039,232	9,887,795
Balance	8,300,235	5,296,417
Interest on cumulative adjustment mortgage bonds	2,427,656	2,431,884
Interest on income mortgage bonds	2,109,720	2,111,520
Balance	3,762,858	753,013

Lease Approved.—Stockholders of this company have approved the leasing of the Kansas City, Clinton & Springfield, which extends from Springfield, Mo., to Kansas City and which has been operated by the St. Louis-San Francisco since its construction.

STATESBORO NORTHERN.—*Securities.*—This company has applied to the Interstate Commerce Commission for authority to acquire part of the Savannah, Augusta & Northern from Stevens Crossing to Statesboro, Ga., 40 miles, and to sell \$20,000 of common stock and \$120,000 of first mortgage 6 per cent five-year bonds.

TEXAS & PACIFIC.—*Receivers Discharged.*—Receivers for this company have been discharged, and J. L. Lancaster, who has been one of the receivers, has been elected president.

WESTERN PACIFIC.—*Annual Report.*—The annual report for the year ended December 31, 1923, shows a net income of \$1,819,796, as compared with \$1,105,345 in 1922. A selection of the principal items in the income account follows:

	1923	1922	Increase or Decrease
Freight revenue	\$10,513,455	\$9,476,588	\$1,036,867
Passenger revenue	2,424,229	2,150,177	274,052
Total operating revenue	14,138,269	12,505,348	1,632,921
Maintenance of way and structures	2,293,005	1,970,510	322,495
Maintenance of equipment	2,371,894	2,219,572	152,322
Traffic	427,171	398,274	28,897
Transportation	4,744,636	4,558,399	186,237
General	416,285	453,752	—37,467
Total operating expenses	10,663,712	9,837,151	826,561
Net operating revenue	3,474,557	2,668,198	806,360
Railway tax accruals	951,168	962,895	11,727
Operating income	2,522,208	1,704,461	817,747
Gross income	4,327,347	3,150,102	1,177,245
Total deductions from gross income	2,507,552	2,044,757	462,794
Net income	1,819,796	1,105,345	714,450
Income applied to sinking fund	50,000	50,000	.....
Dividend appropriation of income	857,560	262,900	594,660
Income balance	912,236	792,445	119,790

Dividends Declared

Atlantic Coast Line.—Common, $3\frac{1}{2}$ per cent; common (extra), 1 per cent; both payable July 10 to holders of record June 18.
 Boston & Albany.— $2\frac{1}{2}$ per cent, quarterly, payable June 30 to holders of record May 31.
 Erie & Pittsburgh.— $\$.87\frac{1}{2}$, quarterly, payable June 10 to holders of record May 31.
 Louisville & Nashville.—3 per cent, payable August 11 to holders of record July 15.
 Midland Valley.—Preferred, \$1.25, payable June 2 to holders of record May 24.
 Pittsburgh, Youngstown & Ashtabula.—Preferred, $1\frac{1}{4}$ per cent, quarterly, payable June 2 to holders of record May 20.

Trend of Railway Stock and Bond Prices

	May 20	Last week	Last year
Average price of 20 representative railway stocks	63.20	63.58	62.59
Average price of 20 representative railway bonds	85.23	85.33	82.83

Railway Officers

Executive

C. T. Jaffray, president of the Minneapolis, St. Paul & Sault Ste. Marie, has also been elected president of the Spokane International.

J. A. Somerville, general manager of the Texas & Pacific, with headquarters at Dallas, Tex., has been elected vice-president in charge of operation with the same headquarters, a newly created position.

J. B. Payne, traffic manager, with headquarters at Dallas, has been elected vice-president in charge of traffic, also a newly created position. Mr. Somerville was born on November 25, 1867, at Carthage, Ill. He entered railway service in November, 1887, in the local freight office of the Chicago, Burlington & Quincy at Keokuk, Iowa, and in 1897 was promoted to general agent at Hannibal, Mo. He was promoted to local freight agent at St. Louis, Mo., in 1899 and the following year was promoted to contracting freight agent at St. Joseph, Mo. Mr. Somerville was appointed chief clerk to the general freight agent at St. Louis in 1902 and in the following year was promoted to general agent at Keokuk, Iowa. He was promoted to superintendent of terminals at St. Louis, Mo., in 1905 and held this position until 1908, when he was appointed division superintendent of the Missouri Pacific at Kansas City, Mo. He was promoted to superintendent of transportation in February, 1913, and held this position until January, 1917, when he was promoted to general superintendent of transportation. From March to December, 1917, Mr. Somerville served on the Commission on Car Service of the American Railway Association at Washington, D. C. In January, 1918, he was appointed assistant manager of the Car Service division and he held this position until January, 1919, when he returned to the Missouri Pacific as general superintendent of transportation at St. Louis, Mo. Mr. Somerville was promoted to general manager under the United States Railroad Administration in April, 1919, his jurisdiction extending over the Missouri Pacific, the Texas & Pacific, the Gulf, Texas & Western, the Ft. Worth Belt, the Denison & Pacific Suburban, and the Weatherford, Mineral Wells & Northwestern. On March 1, 1920, Mr. Somerville was appointed general manager of the Texas & Pacific, with headquarters at Dallas, Tex., and he continued in this position until his recent election as vice-president in charge of operation. Mr. Payne was born



J. A. Somerville



J. B. Payne

on March 24, 1872, in Bowling Green, Ky. After graduating from Ogden College at Bowling Green, he entered railway service in the traffic department of the Atchison, Topeka & Sante Fe. From November, 1889, to March, 1893, he served in the traffic department of the Mexican Central, on the latter date entering the service of the Texas & Pacific as a stenographer in the traffic department. Mr. Payne was later promoted to rate clerk and to commercial agent and he held the latter position until 1912, when he was promoted to assistant general freight agent with headquarters at Dallas, Tex. He was promoted to general freight agent with the same headquarters in 1916 and in May of the following year, was promoted to assistant freight traffic manager. Mr. Payne was promoted to traffic manager, with headquarters at Dallas in 1918 and continued in that capacity until his recent election as vice-president in charge of traffic.

Duncan C. Grant, chief inspector of the Bank of Toronto, has been elected vice-president in charge of finance of the Canadian National. The duties of this office have been carried on under the president's office since the resignation a year ago of Graham A. Bell, who is now Deputy Minister of Railways and Canals at Ottawa.

Marvin Hughitt, Jr., vice-president in charge of operation of the Chicago & North Western, with headquarters at Chicago, has been elected executive vice-president, with the same head-



M. Hughitt, Jr.

quarters, a newly created position. **Frank Walters**, general manager, with headquarters at Chicago, has been elected vice-president in charge of operation, with the same headquarters, succeeding Mr. Hughitt. **William Walliser**, assistant general manager, with headquarters at Chicago, has been elected vice-president in charge of personnel, with the same headquarters, a newly created position. Marvin Hughitt, Jr., was born on September 24, 1861, at Bloomington, Ill., and entered railway service in 1881 in the

general freight department of the Chicago & North Western, at Chicago. In February, 1887, he was promoted to division freight agent and in January, 1893, he was promoted to assistant general freight agent. Mr. Hughitt was promoted to general freight agent, with headquarters at Chicago, in October, 1896, and he held this position until February, 1900, when he was promoted to freight traffic manager. He was promoted to general traffic manager, in November, 1915. Mr. Hughitt was elected vice-president in charge of operation in May, 1916, and he continued in this position until his recent election as executive vice-president.

Financial, Legal and Accounting

R. A. Kirkpatrick has been appointed general claim agent of the Pere Marquette, with headquarters at Detroit, Mich.

C. H. Bender has been appointed assistant treasurer of the Duluth, South Shore & Atlantic, with headquarters at Marquette, Mich.

R. A. Miller, assistant tax commissioner of the Chicago & North Western, with headquarters at Chicago, has been promoted to general tax agent, with the same headquarters, a newly created position.

Operating

C. F. Sundell has been appointed superintendent of dining and sleeping cars of the Minneapolis, St. Paul & Sault Ste. Marie, with headquarters at Minneapolis, Minn.

F. H. Hammill, assistant general manager of the Chicago & North Western, with headquarters at Chicago, has been promoted to general manager, with the same headquarters, suc-



F. H. Hammill

ceeding Frank Walters, who has been elected vice-president in charge of operation. **G. B. Vilas**, general superintendent of the Eastern lines, with headquarters at Chicago, has been promoted to assistant general manager, with the same headquarters, succeeding Mr. Hammill. **B. E. Terping**, assistant general superintendent, with head-



G. B. Vilas

quarters at Chicago, has been promoted to general superintendent, with the same headquarters, succeeding Mr. Vilas. **F. H. Hammill** was born in Rockford, Ill., and in 1886 entered railway service as an operator on the Chicago & North Western. He was later appointed operator and bill clerk on the Chicago, Milwaukee & St. Paul, and subsequently was promoted to train dispatcher and chief train dispatcher.

Mr. Hammill was appointed chief train dispatcher of the Galena division of the Chicago & North Western in 1902, and in July, 1905, he was promoted to trainmaster of the Iowa division. He was promoted to assistant superintendent of the Madison division in July, 1905, and in November, 1906, was promoted to superintendent of the Sioux City division. Mr. Hammill was transferred to the Northern Wisconsin division in November, 1906, and in November of the following year, he was transferred to the Iowa division. He was transferred to the West Iowa division in May, 1911, and held this position until February, 1913, when he was promoted to assistant general superintendent at Boone, Ia. Mr. Hammill was appointed general superintendent of the Northern district of the Union Pacific in October, 1917, and he held this position until March, 1920, when he returned to the Chicago & North Western as assistant general manager, with headquarters at Chicago. He remained in this position until his recent promotion to general manager. **G. B. Vilas** was born on April 18, 1868, at Ogdensburg, N. Y., and graduated at Phillips Exeter Academy in 1887. He entered railway service in September of that year in the traffic department of the Chicago & North Western



B. E. Terping

and subsequently served as station agent at Eagle Grove, Ia., Madison, Wis., and Kenosha. Mr. Vilas was promoted to local

freight agent at Milwaukee, Wis., in 1898, and he held this position until 1904, when he was promoted to trainmaster. He was promoted to assistant division superintendent, with headquarters at Baraboo, Wis., in 1908, and was promoted to superintendent in 1910. He was promoted to assistant general superintendent, with headquarters at Chicago, in April, 1912, and in 1915, he was promoted to general superintendent, with the same headquarters. Mr. Vilas remained in this position until his recent promotion to assistant general manager. B. E. Terping was born on October 18, 1868, at Richland, N. Y., and entered railway service in 1888 in the operating department of the Wisconsin Central, now a part of the Minneapolis, St. Paul & Sault Ste. Marie. In 1892, Mr. Terping entered the operating department of the Chicago & North Western at Chicago and subsequently served in various capacities in that department. He was promoted to trainmaster, with headquarters at Tracy, Minn., in 1904, and in 1905, he was promoted to assistant division superintendent, with headquarters at Chicago. Mr. Terping was promoted to division superintendent, with headquarters at Belle Plaine, Ia., in 1914 and held this position until 1918 when he was transferred to Chicago. He was promoted to general superintendent, at Chicago, in 1919, and in the following year was appointed assistant general superintendent, with the same headquarters. Mr. Terping continued in this capacity until his recent promotion to general superintendent.

C. J. Foster, acting superintendent of the Southern division of the Chicago Great Western, with headquarters at Des Moines, Ia., has been promoted to superintendent of the Southern division, succeeding C. E. Carson, deceased.

C. W. Harding, chief clerk in the office of the superintendent of telegraph of the Northern Pacific, has been promoted to assistant superintendent of telegraph, with headquarters at St. Paul, Minn., succeeding H. C. James, Jr., whose promotion to superintendent of icing facilities was reported in the *Railway Age* of May 3.

L. T. Johnston, superintendent of the Superior division of the Chicago, Milwaukee & St. Paul, with headquarters at Green Bay, Wis., has been transferred to the River and Iowa & Minnesota divisions, with headquarters at Minneapolis, Minn., succeeding **D. E. Rössiter**, who has been transferred. **F. C. Dow**, division superintendent, with headquarters at Tacoma, Wash., has been transferred to the Superior division, succeeding Mr. Johnston.

Traffic

J. B. Shores has been appointed general agent for the Texas & Pacific, with headquarters at Atlanta, Ga., succeeding N. C. Wooldridge, deceased.

Russell Houston has been appointed general agent of the Cincinnati, Indianapolis & Western, with headquarters at Atlanta, Ga., in charge of a newly established agency.

R. S. Gordon, assistant general baggage agent of the Atchison, Topeka & Santa Fe, with headquarters at Topeka, Kans., has been promoted to general baggage agent, with the same headquarters, succeeding Patrick Walsh, whose death on April 13 was reported in the *Railway Age* of April 19.

W. C. Ryan, district freight and passenger agent of the International-Great Northern, with headquarters at El Paso, Tex., has been appointed general agent, freight department, with headquarters at Laredo, Tex., succeeding **T. S. Taber**, who has been appointed district freight and passenger agent at El Paso.

N. S. Davis, general agent for the Ft. Worth & Denver City and the Wichita Valley, with headquarters at Ft. Worth, Tex., has been promoted to assistant general passenger agent, with the same headquarters, succeeding J. J. Lawrence, who has retired. **J. F. Lehane, Jr.**, has been appointed general agent at Ft. Worth, succeeding Mr. Davis.

R. A. Webster has been appointed district traffic agent of the New York, Chicago & St. Louis, with headquarters at Davenport, Ia., in charge of a newly established agency. **G. H. McHugh**, division freight agent of the Lake Erie & Western district, with headquarters at Peoria, Ill., has been given extended jurisdiction to include the Nickel Plate district and the Clover Leaf district.

T. W. Proctor, general freight agent of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, has been promoted to assistant freight traffic manager, with the same headquarters, a newly created position. **E. A. Lalk** has been appointed general agent, with headquarters at Milwaukee, Wis., succeeding F. N. Hicks, whose promotion to assistant traffic manager was reported in the *Railway Age* of April 19.

F. N. Hicks, whose promotion to assistant traffic manager of the Chicago, Milwaukee & St. Paul, with headquarters at Seattle, Wash., was reported in the *Railway Age* of April 19, was born on March 15, 1881, at Chicago. He entered railway service in October, 1898, in the general office of the Lake Erie & Western at Indianapolis, Ind., and in June, 1900, entered the traffic department of the Chicago, Indianapolis & Louisville at the same place. Mr. Hicks entered the service of the Chicago, Milwaukee & St. Paul in April, 1904, as traveling freight and passenger agent at Philadelphia, Pa. He was transferred to Indianapolis as traveling passenger agent in September, 1906, and in April, 1911, he was promoted to city passenger agent at Chicago.



F. N. Hicks

He was promoted to New England freight and passenger agent, with headquarters at Boston, Mass., in January, 1917, and held this position until May, 1918, when he left railway service for two years. Mr. Hicks re-entered the service of the Chicago, Milwaukee & St. Paul in March, 1920, as general agent at Chicago. He was transferred to Milwaukee, Wis., in June, 1922, and remained in that position until his recent promotion to assistant traffic manager.

Mechanical

The headquarters of **G. B. Frabel**, assistant general superintendent of motive power of the Southwestern region of the Pennsylvania, have been removed from St. Louis, Mo., to Columbus, Ohio.

Engineering, Maintenance of Way and Signaling

B. S. Dickerson, assistant engineer maintenance of way on the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Mattoon, Ill., has been promoted to office engineer, with headquarters at Cincinnati, Ohio.

R. A. Cook, whose promotion to chief engineer of the Chicago & Alton, with headquarters at Chicago, was reported in the *Railway Age* of May 10, was born on April 6, 1881, at Lonsdale, R. I. He graduated from the Massachusetts Institute of Technology in 1903 and entered railway service in June of that year as a rodman on the Chicago & Alton. He was promoted to assistant engineer in charge of maintenance work in 1904, and in 1909, was appointed engineer in charge of track elevation and construction work. Mr. Cook was promoted to valuation engineer in 1913 and continued in that capacity until his recent promotion to chief engineer.

Obituary

J. H. Hohl, formerly superintendent of the East St. Louis Junction Railroad, died in Los Angeles, Cal., on May 17.

Benjamin Norton, formerly president of the Toledo, St. Louis & Western and vice-president of the Long Island, died in New York on May 21.

F. W. Brown, general freight and passenger agent of the Chicago, Peoria & St. Louis, with headquarters at East St. Louis, Ill., died in that city on May 16.